Mighty Physics Semester Review

Although you may use your notes on the Semester Exam, there is insufficient time to look up very much. You MUST know your stuff for this exam!!!

Practice your notes **in writing!** Here are some things to be sure you know:

Practice **in writing** each type of physics problem. For Example:

- Significant Digits
- Powers of Ten
- Vectors
  - Resultant
  - Equilibrant
- Distance
- Speed
- Velocity
- Acceleration
- Gravity
- Free Fall
- Newton's Laws
- Mass & Weight
- Forces on Incline
- Friction
- Parallel Forces
- Center of Mass
- Center of Gravity
- Torques
- Equilibrium
  - Translational
  - Rotational
- Trajectories
- Circular Motion
- Radian Measure
- Rotational Inertia
- Pendula
- Work
- Power
- Mechanical Advantage
  - by Forces (AMA)
  - by Distances (TMA)
  - Efficiency
- Potential Energy
- Kinetic Energy
- Momentum
- Tensile Strength
- Stress & Strain
- Young's Modulus
- Pressure
  - Atmospheric
  - Total Force
- Hydraulics
  - Manometers
- Temperature Scales
- Calories
- Expansion
- Charles' Law
- Boyle's Law
- Gas Laws
- Heat Exchange
- Specific Heat
- Warming Curve of H_2O
- Heat of Fusion
- Heat of Vaporization

Terms: Be able to Define, Explain, and Provide Examples for these terms:

- Historical Introduction
  - Natural Philosophy
  - Thales of Miletus
  - Democritus
  - Empedoclese
  - Aristotle
  - Friar Bacon
  - Sir Francis Bacon
  - Robert Boyle
  - Sir Isaac Newton
  - Galileo Galilee
- Energy Problem
  - Overpopulation
    - Right here!
- Hypothesis
- Theory
- Law
- Matter
- Mass
- Inertia
- Density
- Energy
  - Potential
  - Kinetic
- Conservation Laws
  - $E=mc^2$
- Metric Units
  - Metric Prefixes
- Significant Digits
- Accuracy
- Precision
- Orders of Magnitude
- Proportion
  - Direct
  - Inverse
- Scalar Quantity
- Vectors
  - Resultant
  - Equilibrant
- Speed & Velocity
- Acceleration
  - Linear
  - Gravitational
  - Free Fall
  - Terminal Velocity
  - Elevator Problems
- Newton's Laws
  - Inertia
  - Acceleration
  - Interaction
  - Gravity
- Mass vs. Weight
- Composition of Forces
- Resolution of Forces
- Friction & Coefficient
- Center of Gravity
- Center of Mass
- Torques
- Trajectories
- Frames of Reference
- Satellites
- Centrifugal Effect
- Centripetal Effect
- Circular Motion
- Radian Measure
- Angular Velocity
- Angular Acceleration
- Rotational Inertia
  - Carousel Problem
- Coriolis Effect
- Gyroscopic Effects
  - Precession
  - Gyro Inertia
- Harmonic Motion
  - Reference Circle
- Laws of the Pendulum
  - Length
  - Mass
  - Gravity
  - Displacement
- Critical Velocity
- Work
- Power
- Energy
  - Potential
  - Kinetic
- Mechanical Advantage
  - by Forces (AMA)
  - by Distances (TMA)
- Efficiency
- Momentum
  - Conservation of
- Collisions
  - Elastic Collision
  - Inelastic Collision
- Angular Momentum
- Impulse
- Units
  - Newton
  - Joule
  - Watt
- Matter
  - Element
  - Atom
  - Compound
  - Molecule
  - Mixture
    - Homogeneous
    - Heterogeneous
- Parts of Atom
  - Electron
  - Proton
  - Neutron
- Isotope
- Kinetic Theory
  - Evidences
    - Gas Pressure
    - Expansion, heating
    - Evaporation
    - Vapor Pressure
    - Diffusion
    - Osmosis
    - Brownian Motion
    - Micro graphs
- States of Matter
  - Solid
  - Liquid
  - Gas
  - Plasma
- Physical Properties
  - Cohesion
  - Adhesion
  - Diffusion
  - Tensile Strength
  - Ductility
  - Malleability
  - Elasticity
  - Stress
  - Strain
  - Young's Modulus
  - Surface Tension
  - Capillarity
  - Melting
  - Boiling
  - Crystal Structure
  - Regelation
  - Vapor Pressure
  - Boiling Point
  - Two ways to boil
- Atmospheric Pressure
  - The Duke of Tuscany
  - Torricelli
  - Density of air
    - 1g/liter
  - Units of atmospheric pressure
    - 10 meters of water
    - 760 mm of mercury
    - 1 kg/cm^2
    - 101 kPa
  - The Siphon
  - Suction & Vacuum
  - Magdeburg Hemi-pheres
- Bernoulli's Principle
  - The Brass Aspirator
  - Goose shower curtain
  - Airplane wing lift
  - Curving baseball
  - Carburetor
  - Boats too close
- Archimedes' Principle
  - The King's Crown
    - Buoyancy
      - Air
      - Water
      - Ships float in H_2O
      - Air ships go up
      - Boat/Rock Problem
      - Hydrometers
- Pascal's Law
  - Hydraulics
- Heat & Temperature
- Absolute Zero
- Celsius vs. Kelvin
- Finding Absolute Zero
- The Calorie
- Law of Heat Exchange
- Maxwell's Demon
- Boltzman's Statistics
- Thermal Expansion
- Expansion of H_2O
- Boyle's Law
- Charles' Laws
- Specific Heat
- The Triple Point
- First Law of Thermodynamics
  - Conservation of energy
- Second Laws of Thermodynamics
  - Law of Entropy
- Heat Transfer
  - Conduction
  - Convection
  - Radiation
  - Thermos Bottle action
- Heat Engines
- Adiabatic changes
- Cloud/ Fog Formation
  - Advection
  - Radiation
  - Adiabatic (upslope)
- Tides
  - Spring
  - Neap
  - Perigee
  - Apogee
- Eclipses
  - Moon
  - Sun
- Phases of Moon
  - Quarters
  - Half
  - Full
- Seasons
  - Autumn
  - Spring
  - Summer
  - Winter
- Precession of the Equinoxes
- North Star Polaris