Assign. #_

Name
Date
Period

Instructions for:

"SEMI Study Guide for Final"

Due: The day we score Final #2!

1) Use 1 – 8.5" x 11" notepaper/computer paper. Use both sides.
2) Those of you who made & saved 3"x5" Notecards — This will be a lot easier for you :) *Get to use it on the final.
3) You can write this by hand or Type it on computer. I suggest typing.
4) You save this! You'll use it and get credit for it again 2nd Sem!
5) Outline it by chapters as follows...
6) Only put on the study guide what is important! key concepts, formulas, How to use them Equations

- Ch. 1 About Science / Science Fundamentals (Adv. Phy. Ch. 1 "A Phy. Toolkit")
- Ch. 2 Linear Motion (lots of Equations!) (Adv. phy. Ch. 2 and 3) — Horizontal motion, Vertical motion
- Ch. 17 Plate Tectonics (No time)
- Ch. 3 Projectile Motion (Adv. Phy. Ch. 6)
- Ch. 4 Newton's 1st Law – "Inertia" of Motion (Adv. Phy. Ch. 4) (more examples)
- Ch. 5 Newton's 2nd Law: $F = m \times a$ ($W = m \times g$) $a = \frac{F}{m}$ of Motion (Adv. Phy Ch. 4)

(Adv. phy. CH. 4)

- CH. 6 Newton's 3rd Law: "Action & Reaction"
- CH. 9 Centripetal Force: $F_c = \frac{mv^2}{r}$ (Adv. Physics CH. 6) of Motion
  CH. 12: (Adv. phy. CH. 7)
- Newton's Universal Law of Gravity "NULOG":

$$F_g = G\frac{m_1 m_2}{d^2}$$

$$G = 6.67 \times 10^{-11}\ \frac{N \cdot M^2}{kg^2}$$

*Understand: "NULOG" is an inverse distance^2 law. 2x distance? ½x distance? (Use easy numbers to prove it.)

*Gravity is weak!

* Increase the distance 2x and F_g goes to ¼!

* Decrease the dist. to ½ and F_g goes to 4x!

- CH. 29 Our Solar System (Planetary Motion)
  - Geocentric model → Heliocentric model (Aristotle to Newton)
  - Kepler's Laws of Planetary Motion (3)
    - ellipses
    - $A_{in} = t$
    - $P^2 = a^3$
  - The Solar System (The scale of Solar System Activity) (Adv. phy. CH. 2)
- CH. 7 Impulse & Momentum ("aka Inertia in Motion")

per. of motion

$I = Ft$ (___ N·s)

$p = mv$ (___ kg·m/s)

$F = $ ___ N

$t = $ ___ s

$\Delta Ft = \Delta mv$

Similar to N. 2nd Law... $F = ma$ (But not the same!)

$m = $ ___ kg

$v = $ ___ m/s

- The Law of Conservation of Momentum
  - Explosions/Collisions: (Great examples of the law...)
    - Explosions: $m_1v_1 + m_2v_2 = 0$
    - Elastic Collisions: ("Bouncy Collision")

$$m_{1B}v_{1B} + m_{2B}v_{2B} = m_{1A}v_{1A} + m_{2A}v_{2A}$$

    - Inelastic Collisions: ("Sticky Collision")

$$m_{1B}v_{1B} + m_{2B}v_{2B} = (m_{1A} + m_{2A})v_{1+2A}$$

(Adv. Phy. Ch. 10 & 11)

* Theme of physics = "Energy"
* Theme of Chemistry = "matter"

- Ch. 8 Energy
  - What is Energy? Recall: the diff. between matter & Energy.
  - What can Energy do?:
    - Work
    - Change form, from one form to another.
    - Travel (propigate)

Recall: matter can't do these things.

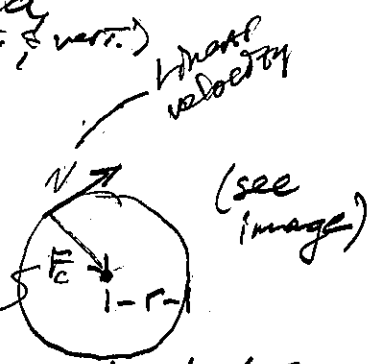
  - Work: $W = F \times d$
  - Power: $P = \frac{W}{t}$
  - Gravitational Potential Energy: $GPE = mgh$
  - Kinetic Energy: $KE = \frac{1}{2}mv^2$
  - "The Law of Cons. of Energy ..." (1st & 2nd Laws of Thermodynamics)
  - Roller Coaster Examples...
  - Q: How soon should you get started on this assignment?
  - A: ASAP! Now!

(Lots more to come!)

Recall: "N. 2nd Law": $F = ma$ (Linear Motion: Hor. & vert.)

Add in:

Ch. 9 Circular Motion
(Adv. Phy Ch. 6)



* Centripetal Force:
~~The force that~~ causes objects to go in circles.

$$F_c = \frac{mv^2}{r}$$

F_c = ___ N (during circular accelerat.)

m = ___ kg

v = ___ m/s

r = ___ m (radius)

Unit Analysis

$$N = \frac{(kg)\left(\frac{m}{s}\right)^2}{(m)}$$

$$N = \frac{(kg)\left(\frac{m^2}{s^2}\right)}{m}$$

$$N = \frac{(kg)\left(\frac{m^2}{s^2}\right)\left(\frac{1}{m}\right)}{\left(\frac{m}{1}\right)\left(\frac{1}{m}\right)}$$

$$N = (kg)\left(\frac{\frac{m}{m}}{s^2}\right)\left(\frac{1}{m}\right)$$

$$\boxed{N = (kg)\left(\frac{m}{s^2}\right)}$$

F_c = mass × acceleration
(m) (a)