# Physics 112

Tuesday, January 5/16

http://mvhs-sherrard.weebly.com/

Textbook - ISBN

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1. Investigation 6-A: Force and Spring Extension (Page 255)
   : Due Date -> 4 Days Late
2. Test - Unit 3 - Wed., Jan. 6/16
3. Exam - Review Problems

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4. Boundary Behaviors
5. Reflection
6. Diffraction
7. Refraction

# Unit 3-Test

## Work

$W = Fd$

* $F \parallel d$
* F single/individual

- lift/lower: $W = mgd$
- accelerates: $W = mad$

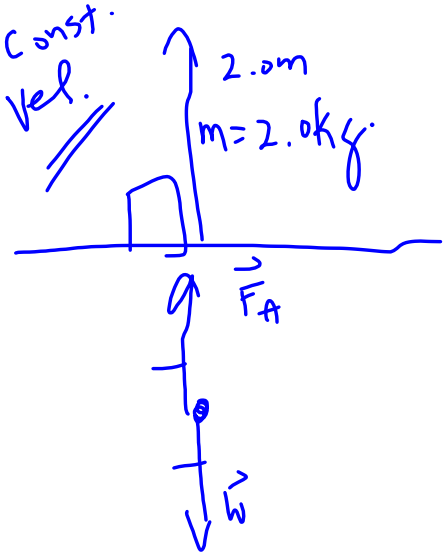
$W = 0\,J$

- $d = 0m$
- $F = 0N$
- $F \perp d$

## Types of Work

2.0kg
$F_A = 10N$, $d = 2.0m$

- Positive: F and d have the same direction
- Negative: $W = Fd$, $W = -mgd$ — F and d have opposite directions




a)
$W = Fd$
$W = mgd$
$W = 10\,J$

b) Type $F_A$? (+)

$F_A = mg$

# Types of Energy

- Kinetic (motion)
  - $E_k = \frac{1}{2}mv^2$
  - * speed constant
  - $v_i \rightarrow v_f$
  - $E_{ki} = \frac{1}{2}mv_i^2$
  - $E_{kf} = \frac{1}{2}mv_f^2$
  - $W = \Delta E_k$
  - $F_d = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$
  - * $W = \frac{1}{2}mv_f^2 - E_{ki}$
- Potential
  - gravitational (position)
    - reference level / zero line
    - $\Delta E_g = mg\Delta h$
    - $E_{gi} = mgh_i$
    - $E_{gf} = mgh_f$
    - $W = \Delta E_g$
    - $F_d = mgh_f - mgh_i$
    - * $F_d = mgh_f$
  - elastic (condition)
    - $E_e = \frac{1}{2}kx^2$
    - $k$ → spring or force constant (N/m)
    - $x$ → extension or compression (m → m)
    - Hooke's L.
      - $F = kx$
      - $F = F_R$
      - opp. direction

# Power

$P = \frac{W}{t}$ - work

$P = \frac{\Delta E}{t}$

watts

$P = \frac{Fd}{t}$

$* \ 1hp = 746\,W$

$P = Fv$

$P = \frac{mgd}{t}$

## Efficiency

$E_K$

$Eff = \frac{[E_o]}{E_i \; E_g} \times 100\%$

$Eff < 100\%$

$Eff = \frac{W_o}{W_i} \times 100\%$

# Conservation of Energy

mechanical energy $= E_K + E_g + E_e$

Assume $\Rightarrow$ no friction

$E_{T_i} = E_{T_f}$

total = mechanical

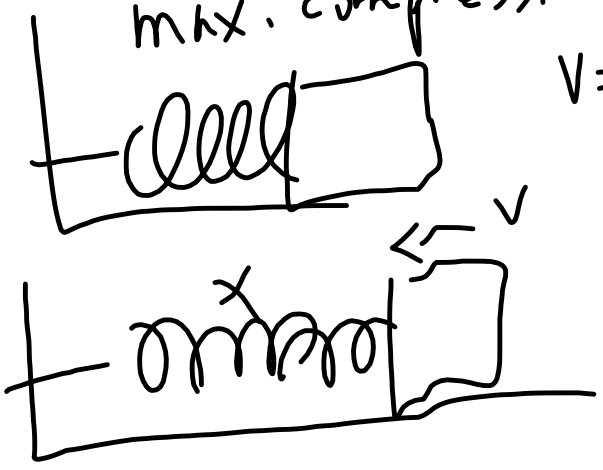
$E_{K_i} + E_{g_i} + E_{e_i} = E_{K_f} + E_{g_f} + E_{e_f}$

$V_i = ?$ $h_i = ?$ $x_i = ?$ $V_f = ?$ $h_f = ?$ $x_f = ?$

ref. level

max. compression

$V = 0$ m/s



# Physics 122

Tuesday, January 5/16

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1. Worksheet - Kepler's Problems
   Experiment 8.1 - Kepler's Laws -> 1 Day Late
   Textbook -> Page 580, PP#1-7

2. Worksheets

3. Unit 2 - Section 3 - Simple Harmonic Motion (SHM)

4. Mass on a Spring - To Be Continued

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5. Text: Page 608, #1-4
   Page 623, #23-27, 30

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Test - Unit 2 -> Wed.
Jan 13/16

# Science 10

Tuesday, January 5/16

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HATS

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1. Assignment: Oh, What a Tangled Web We Weave
   Pass in for marking by Thursday
2. Topics -> Quiz - Ecology to Food Webs -> Thursday, Jan. 7/16
3. Biodiversity
4. Change and Stability in Ecosytems - To Be Continued

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5. Cats in Borneo
6. Bioaccumulation and Biomagnification
7. Article: Keeping Threatened Amphibian Species Afloat
   - Pass in for Marking
8. Sustainability
9. Types of Substances