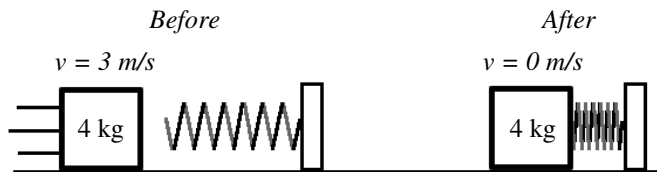


## 2009 Energy 4



- A moving mass is sliding across a frictionless surface. It stops after compressing a spring.
  - $E_{\text{before}} =$                       B.  $E_{\text{after}} =$
  - Was the spring compressed by a force doing work or by the energy of the moving object?
  - If  $k = 50 \text{ N/m}$ , find how far the spring was compressed.

2. For the following Conservation of Energy equations, give the situation.

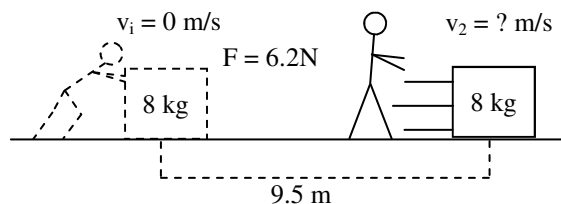
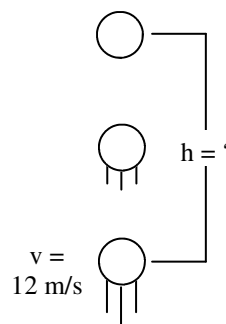
- $PE_{\text{el}} - W = 0$                       Situation:
- $E_p + W = E_p$                       Situation:
- $E_p = E_k$                               Situation:
- $E_k - W = E_k$                       Situation:

3. A ball is going 12 m/s. How far into the air will it go?

- $E_{\text{before}} =$  \_\_\_\_\_    B. Work? = \_\_\_\_\_    C.  $E_{\text{after}} =$  \_\_\_\_\_

D. Conservation of Energy Equation:

E. Solve for how high it goes.



4. Slim Jim pushes on a box with 6.2N of force for 9.5m.

- How much work did Jim do on the box?
- What kind of energy did the box gain?
- How fast is the box going afterwards?

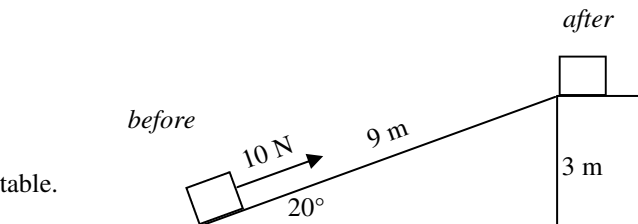
D. If he pushed for 1.5 seconds, how much power did he expend?

*Understanding efficiency:*

5. A 10 N force pulls a 2 kg object up a 9 m long ramp to get the object to the top of a 3 m tall platform.

- Calculate the work done to pull the object up the ramp.
- Calculate the potential energy of the object when it is on the table.

- Was all of the work transferred to the object?
- If energy cannot be created nor destroyed, where did the energy go?
- Find the efficiency of the object (See "Energy Transfer" notes).



*If you don't remember the following song, go to the Study Helps and then Songs and relisten.*

6. From the song: "Metals are on the \_\_\_\_\_ side; nonmetals on the \_\_\_\_\_. Metals tend to \_\_\_\_\_ electrons; nonmetals \_\_\_\_\_ them tight. Losers of electrons become \_\_\_\_\_; gainers of electrons become \_\_\_\_\_. Losers and gainers find themselves electrically attracted and they form \_\_\_\_\_ bonds of love."
7. Metal or nonmetal?
- A. \_\_\_ Lithium      C. \_\_\_ Iron      E. \_\_\_ Magnesium  
B. \_\_\_ Helium      D. \_\_\_ Oxygen      F. \_\_\_ Nitrogen
8. Give the oxidation numbers for the following:
- A. \_\_\_ Calcium      C. \_\_\_ Oxygen      E. \_\_\_ Nitrogen  
B. \_\_\_ Fluorine      D. \_\_\_ Magnesium      F. \_\_\_ Sodium
9. Give the number of valence electrons for the following:
- A. \_\_\_ Helium      C. \_\_\_ Beryllium      E. \_\_\_ Nitrogen  
B. \_\_\_ Oxygen      D. \_\_\_ Argon      F. \_\_\_ Potassium
10. A spring with a spring constant of 25 N/m is stretched 0.4 m in 2 seconds.
- A. Calculate the energy the spring has after it is compressed.
- B. What was done to compress the spring?
- C. Calculate the power used to compress the spring.