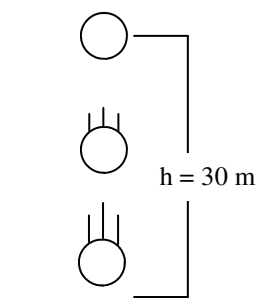
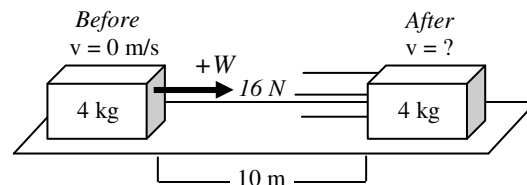


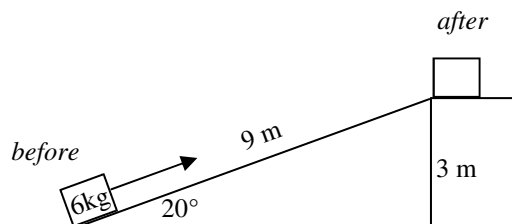
## 2008 Energy 6

- A 4 kg object is at rest on the ground. Then a 16 N force pushes the object for 10 m.
  - What kind of work or energy:
    - Before:
    - While the force is pushing:
    - After:
  - Write the Conservation of Energy equation:
  - Calculate the amount of energy given by the force.
  - Calculate the object's final speed.



- An object is dropped from 30 m. At what height is the object going 12 m/s?
  - What kind of energy did it have before?
  - Since it will still be above the ground and moving, what kind of energy will it have after?
  - Write the conservation of energy equation.
  - Solve for the final height.

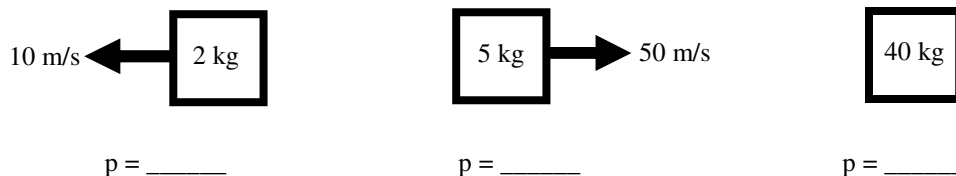
- A 6 kg object is pulled up a ramp.
  - What is the weight of the object (label it)?
  - Since you use \_\_\_\_\_ times the distance, you only need 1/\_\_\_ the force to pull it up this ramp.
  - How much force is necessary to pull it up the ramp?
  - Calculate the work to pull it up the ramp.
  - Calculate the energy it has at the top of the ramp.
  - How do these two numbers compare?  
*(This is always true for simple machines ONLY if there is no friction.)*



- A moving object compresses a spring. When calculating efficiency...
  - What is  $W_{in}$ ?
  - What is  $W_{out}$ ?
- A 3 kg object is moving 2 m/s.
  - Calculate its kinetic energy.
  - The same 3 kg object is accelerated so that its speed is doubled.
  - If the speed is doubled, how fast is it moving?
  - Calculate its new kinetic energy.
  - So, if the speed doubles (increases by a factor of 2) the kinetic energy \_\_\_\_\_  
 (increases by a factor of \_\_\_\_\_.)

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6. A 35 kg object has -450 kgm/s of momentum. Find its velocity.
7. Which has more momentum? (*choose one for each*)  
 A. A car when going fast or slow?                      B. A heavy or light object going 10 m/s?
8. A. Find the momentum for each of the following objects (remembering positives and negatives):



- B. Which of the objects above has the momentum with the greatest **magnitude** (*disregarding direction*)?
- C. Which of the objects in above has the most **inertia**?
- D. Find the net momentum of all of the objects above (*find  $\Sigma p$* ).
9. Work causes a change of energy. \_\_\_\_\_ causes a change of momentum.
10. A 14 N force pushes on a 5 kg object for 4 seconds.  
 A. Calculate the impulse acting on the object.  
 B. If the object started at rest, how much momentum does it end with?
11. Fill in the table below.

	Symbol	Atomic Number	Valence Electrons	# of protons	Oxidation #	Metal/ Nonmetal	# electrons gained or lost
Magnesium							
Oxygen							
Helium							
Potassium							

12. Using electron arrows, combine Potassium and Oxygen.
13. Using electron arrows, combine Calcium and Nitrogen.

**Electron Arrows — Study the following diagrams.**

- The Symbols**
- Losing 1 electron
  - > Gaining 1 electron
  - An ionic bond

<p><i>Magnesium loses 2 electrons</i></p> <p style="text-align: center;"><math>Mg^{2+} \rightarrow \rightarrow</math></p> <p><i>Chlorine gains 1 electron</i></p> <p style="text-align: center;"><math>&gt; Cl^{1-}</math></p>	<p><i>Magnesium will combine with 2 Chlorines</i></p> <p style="text-align: center;"><math>Mg^{2+} \rightarrow \rightarrow Cl^{1-}</math>  <math>\rightarrow \rightarrow Cl^{1-}</math></p> <p><b>Magnesium Chloride: <math>MgCl_2</math> (a 1:2 ratio)</b></p>	<p><i>Magnesium Sulfide: <b>MgS</b></i></p> <p style="text-align: center;"><math>Mg^{2+} \rightarrow \rightarrow</math> Loses 2</p> <p style="text-align: center;"><math>&gt;&gt;</math> <math>S^{2-}</math> Gains 2</p> <p style="text-align: center;"><math>Mg^{2+} \rightarrow \rightarrow S^{2-}</math> <b>MgS</b></p>
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