

**Page 1: Internal & External Forces**

1. What are the two general categories of forces, when it comes to mechanical work and energy?
  - a.
  - b.
2. Gravity forces and spring forces are considered internal forces. What does this mean?
3. Give another example of an internal force not listed on the table and explain why it's internal.




4. How are external forces different from internal forces?

5. **Examples** of PE  $\leftrightarrow$  KE

- a. When a thrown ball is traveling upwards through the air, how is the ball's "type" of energy changing?
- b. As a falling bungee jumper begins to slow down near the bottom, how is the energy changing?



- c.  As a dart is launched from a spring-loaded gun, how is the energy changing?



6. **Examples** of External Work Changing TME (total mechanical energy)

- a. As the tires of a braking car skid across the road, is the mechanical work done on the car + or -?
- b. How does this work change the TME of the car?
- c. As a weightlifter raises a dumbbell, is the mechanical work done on the



- dumbbell + or -?
- d. How does this work change the TME of the dumbbell?

**Page 2: Analysis of Situations Involving External Forces**  
**(Work  $\rightarrow$   $\Delta$ TME)**