

SOME ENERGY/WORK QUESTIONS (Energy2Probs)

- 1) What are some different units for energy?
- 2) What are the types of energy and how are they measured?
- 3) What are the types of mechanical energy?
- 4) Describe the energy changes in a jack in a box (a bobble head on a spring with friction). How would this look on a graph?
- 5) Which type of mechanical energy does NOT depend on position?
- 6) Give a typical amount of Calories of mechanical energy likely to be used by a typical teenager per week. How would this be calculated?
- 7) What is the work done if I lift a 20 kg object 3 meters, then carry it at a constant speed horizontally for 5 meters?
- 8) What is the purpose of a simple machine?
- 9) Explain why all simple machines are really either levers or ramps:

- 10) A parachutist with a mass of 40.0 kg jumps out of an airplane at an altitude of 5000 m. After the parachute deploys, the parachutist lands with a velocity of 6.00 m/s. Using the work–kinetic energy theorem, find the energy that was lost to air resistance during this jump.
- 11) A lever with an effort arm of 4 cm, and a resistance arm of 8 cm is attached to a 2 string pulley holding a 4 kg mass. If it takes 60 Newtons of force to push on the lever to lift the mass then find:
 Work In: Work Out: Ideal mech Advantage: Actual Mech Advantage:
 Efficiency
- 12) A force of 1250 N is needed to move a crate weighing 3270 N up a ramp that is 4.55 m long. If the elevated end of the ramp is 0.750 m high, what is the efficiency of the ramp?
- 13) A spring is pulled back from rest 20 cm with 40 N of force. If it hits a 3 kg mass, what is its starting elastic energy? How fast is it going when it leaves the spring? (no friction). How high does it go?
- 14) A still person with a mass of 156 kilogram catches a 9 kilogram ball going 30 meters/second, which causes him to roll down a hill (starting at 1.636 m/s) . What is the total energy after the collision? If they are on the top of a 2 meter tall hill, what is the velocity at the bottom of the hill?