Discussion Questions – Energy

1. Does a car burn more gasoline when its lights are turned on? Does the consumption of gasoline depend on whether or not the engine is running?
2. An inefficient machine is said to “waste energy”. Does this mean that energy is actually lost?
3. If your friend pushes a lawnmower 4 times as far as you do while exerting only half the force, which one of you does more work? How much more?
4. Two people who weigh the same climb a flight of stairs. The first person climbs the stairs in 30 s, and the second person climbs them in 40 s. Which person does more work? Which uses more power?
5. Advertisements for the Superball once stated that it would rebound to a height greater than the height from which it was dropped. Is this possible?
6. When a riffle with a longer barrel is fired, the force of expanding gases acts on the bullet for a longer distance. What effect does this have on the velocity of the emerging bullet? (Do you see why long-range cannons have such long barrels?)
7. Explain how “elastic potential energy” dramatically changed the sport of pole vaulting when flexible fiberglass poles replaced stiffer wooden poles.
8. A moving hammer hits a nail and drives it into a wall. If the hammer hits the nail with twice the speed, how much deeper will the nail be driven? If it hits with 3 times the speed?
9. Does the string that supports a pendulum bob do work on the bob as its swings to and fro? Does the force of gravity do any work on the bob?
10. If a golf ball and a Ping-Pong ball both move with the same kinetic energy, can you say which has the greater speed? Explain in terms of the definition of KE. Similarly, in a gaseous mixture of heavy molecules and light molecules with the same average KE, can you say which have the greater speed?