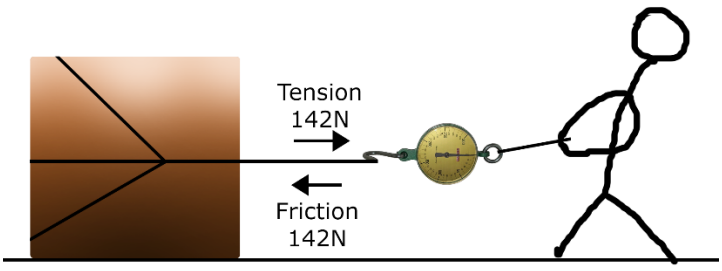
## Test #2

1. Energy.
2. The definition of potential energy is the ability to do work and of kinetic energy is the energy of motion. Practically, that means that potential energy is stored energy, or energy that is there but isn't doing anything because the energy is not being actively released or used. The energy stored in the bonds of gasoline sitting in the gas tank is a good example of potential energy—the energy is there, but it isn't doing anything when it is just sitting in the gas tank. Kinetic energy is visible because it is the energy expended to do work. When the car starts, the bonds of the gasoline are broken and when they are broken, they release energy, which moves the pistons.
3. False.
4. Kinetic theory states that molecules are always moving, not only is the entire molecule moving, but also the atoms of the molecule vibrate about their bonds. The higher the temperature the matter is, the more kinetic energy the molecules have, so the more they move about in space and the more the atoms of each molecule move about their bonds. The molecules of the hot water, therefore, are moving a lot more/faster in the pan than the molecules of the cold water are, which causes them to bounce around against the sides of the pan and each other a lot more than the cold water molecules. We can see the effects of that when dropping dye into the water. The dye gets carried around the space of the hot water pan faster because of the water molecules moving all over the place, but the molecules don't much, at all, in the cold-water pan and so they don't carry the blue dye around the pan.
5. True.
6. They must be in thermal contact or else no heat transfer will occur.
7. False.
8. 1,000cal = 1C
9. Mercury heats up and cools down faster than copper because its specific heat is lower than copper's.
10. ΔT stands for the change in temperature.
11. $8.5725 \times 10^6$J (8,572,500J)
12. True.
13. An object in static equilibrium is not in motion and the sum of all forces on that object is 0. An object in dynamic equilibrium is in motion and the sum of all forces on that object is 0. The difference, then is if the object is in motion, or not.
14. True.
15. A contact force is a force that can only be exerted when two objects are in contact. A non-contact force is a force that can be exerted when two objects are not in contact.
16. True.
17. Newtons (N).
18. The force of earth's gravity pull on an object's mass.
19. It means that a force has both a magnitude and direction.
20. 

21. Free body diagram.
22. True.
23. Calculate the net force acting on an object.
24. True.
25. False.
26. True.