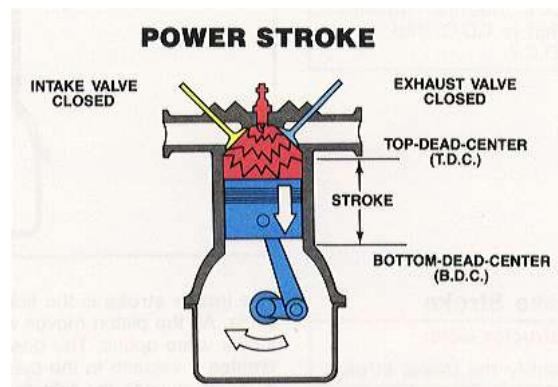


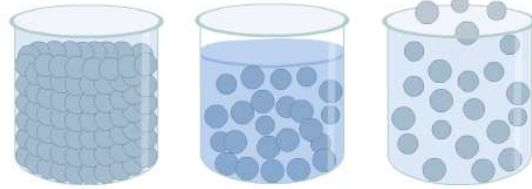
Thermodynamics Homework 1

1. According to thermodynamics, which direction does heat flow?
2. List the 3 most common units of temperature?
3. Describe the relationship between the kinetic energy of molecules and the temperature of a substance.
4. It's supposed to be 20°C in London today. What temperature is that in Fahrenheit?
5. Convert 100°C into Kelvin.
6. Convert absolute zero into Celsius and Fahrenheit.
7. Water Boils at 100°C and freezes at 0°C . What temperature does water boil and freeze in Fahrenheit?
8. A 1200kg car has 200N of force applied for 10s. What is the impulse applied to the car?
9. A bicyclist rides 15.2km in an hour. What was the bicyclist's average velocity?(put answer in m/s)
10. Look up and define the 1st, 2nd and 3rd law of thermodynamics.
11. A rock dropped from a height of 12m. How fast is it going just before hitting the floor?
12. A roller coaster is at the top of a 30m high hill at rest and begins to roll down to the bottom. What is the velocity of the roller coaster at the bottom of the hill?
13. A balloon has helium inside at room temperature. A person has a hot bowl of soup to eat. Which molecules have the most kinetic energy? (the helium molecules in the balloon or the water molecules in the soup)
14. The piston in the picture is undergoing its "power stroke". The gas explodes, thus gets hot and expands. It pushed the piston so the piston can do _____. (hint: the piston will apply a force over a distance)



Thermodynamics Homework 1

15. Write the state of matter that best represents each of the substances below: Use Liquid, solid and gas



16. Which of the three beakers above has molecules with the most kinetic energy?
17. What is the momentum of a 20kg cart traveling at 12m/s?
18. What is the kinetic energy of the cart in #17?
19. What is the potential energy of a 30kg bowling ball that is sitting on a 14m high hill?
20. What is the centripetal force required to keep a 1500kg car traveling in a 30m circular radius at a speed of 8.0m/s?