Knowledge

1. Density = mass/volume
2. Length x breadth x height
3. Immerse in water in a displacement can and catch and measure the volume of water displaced
4. Specific heat capacity
5. The energy needed to change the state of 1Kg of a substance
6. Energy = specific latent heat x mass (Kg)
7. It stays the same
8. The pressure exerted on the walls of a container by gas particles
9. Condensing

Application

1. The amount of energy needed to change 1Kg of a substance from liquid to gas (or the amount of energy released when 1Kg of a substance changes from gas to liquid)
2. The arrangement of particles in a solid is neat and ordered in rows, with particles all closely packed and touching, whereas in a gas the arrangement is random and particles are spread far apart. In a solid, the particles are only vibrating in a fixed position, whereas in a gas they are moving around and have a lot more kinetic energy.

3. Energy = $0.018 \times 2.3 \times 10^6$

Energy = 41400J

4. Between A and B, the temperature is staying the same (-40°C) and the particles are still vibrating. All the energy going into the solid is being used in overcoming the forces of attraction between the solid particles – so they are not increasing in kinetic energy

Between B and C, the temperature is increasing because the particles are gaining kinetic energy and moving around.

5. As water cools and turns into ice, the kinetic energy of the particles decreases and they stop moving around to become fixed in position and only vibrating. They go from a random, changing arrangement to a fixed, neat pattern, with particles in rows.

6. To find the density of an irregular object, you would need a displacement can and a measuring cylinder. Fill the displacement can with water, submerge the object in the water and catch the water that is displaced. Measure the volume of water using the measuring cylinder and this is the volume of the object.

7. $D = m/v$

   $D = 1.282/2$

   $D = 0.641 kg/m^3$

Extend

8. Change the mass of the cork into kg.

   10/1000 = 0.01kg

   D=m/v

   v = mass/density

   volume = 0.01/240

   volume = 0.00004167m^3

   volume =4.167 x $10^{-5}m^3$

9. As the temperature increases, the kinetic energy of the particles increases

This means there are more frequent collisions between the particles and the container walls.

The collisions also occur with greater force.

So the force on the container wall increases