Physics

Particle model

- Everything Is made up of tiny particles
- Particle model explain how these particles behaves in solid , liquid and gas
- The particles can be thought of as tiny balls
- How matter behaves depend on how these balls moves in forces between them
- The particle models are the same in all states only their arrangement and energy changes

Solid

- particles are held closer Together by strong forces in a fixed regular pattern
- They only vibrate in their places because they have little energy
- Solids have high density since particles are packed closed together

Liquid

- forces between particles are weak then in solids
- Particles are closed but can move around each other in irregular arrangement

- They have more energy than solids but less than gases
- Liquid particles move slowly and randomly
- Liquids are less dense than solids

Gases

- There are almost no forces between particles
- Particles have much more energy and move freely in random directions at high speed
- Gases have low density

Density

- Density shows how much mass is in a certain volume

Formula of density

- Density= mass / volume

Unit of density

- kg/m3

- Materials with tightly packed particles are denser
- Compressing a material increases its density because particles move closer

- If the volume is high so density will decrease and if the volume is low so density will increase
- Solids are higher dense than liquids and gases are the least dense

Internal energy and changes of state

- Particles have kinetic energy and potential energy
- Total of these energy is equal to internal energy
- Kinetic energy + Potential energy = Internal energy
- Heating give energy to these particles making them move more faster
- This can cause rise in temperature or change of state

Change of state

- Heating a solid makes it melt it is called liquid
- Heating a liquid make it boil it is called gas
- Cooling does the opposite
- Like when you cool the water it will become ice
- The substance stays the same only its form is changing

- Mass conserved and there is no loss in part

Specific latent heat

- Energy needed to change 1 kg of substance from one state to another state without change in temperature

Formula of specific latent heat

- Energy= mass x specific latent heat

Unit of specific latent heat

Unit is Joule per kg J/kg

Latent heat of Fusion means changing from one solid to liquid

Latent heat of vaporization Means changing from liquid to gas

Particle motion in gases

- Gas particles move freely and collide with each other and the container
- Each collision exerts force and it will create a Gas pressure

Formula of pressure

pressure= force / area

Temperature and gas pressure

- **Increasing temperature gives particle more kinetic energy**
- **They move faster and hit the container was more often and harder**
- **This will increase pressure and volume stays constant**

A gemstone of mass 0.019 kg displaces 7.0 cm cube of water you have to calculate the density

If the specific latent heat of fusion is 120,000 and mass is 250 grams what will be the energy