# 9. Phases of matter

Content

9.1 Density

9.2 Solids, liquids, gases

9.3 Pressure in fluids

9.4 Change of phase

1. define the term density
2. relate the difference in the structures and densities of solids, liquids and gases to simple ideas of the spacing, ordering and motion of molecules

Explain:

Why a liquid is incompressible?

Why a solid has a fixed shape?

Why a gas fills any container?

1. describe a simple kinetic model for solids, liquids and gases

|  |  |  |  |
| --- | --- | --- | --- |
| Phase (state) | Arrangement of particles | Particle spacing | Movement of particles |
| Solid |  |  |  |
| Liquid |  |  |  |
| Gas |  |  |  |

1. describe an experiment that demonstrates Brownian motion and appreciate the evidence for the movement of molecules provided by such an experiment

Draw a labeled diagram

1. distinguish between the structure of crystalline and non-crystalline solids with particular reference to metals, polymers and amorphous materials
2. define the term pressure and use the kinetic model to explain the pressure exerted by gases
3. derive, from the definitions of pressure and density, the equation *p* = ρ*gh*

*Derive*

* *Defining equation for pressure →*
* *Defining equation for density →*
* *Use F (weight) = ????? →*
* *Use V (volume) = ????? →*
* *Clever maths bit →*
* *Cancel and rearrange for P →*

*(h)* use the equation *p* = ρ*gh*

*(i)* distinguish between the processes of melting, boiling and evaporation.

**Paper 1 questions**

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**Paper 2 questions**

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