Particle model of matter

Answers

GCSE science knowledge recall

This topic online

Q	Answer	Remember
1	density	Density tells you how tightly the mass is packed into the space a material takes up.
2	volume	ρ = m ÷ V. The Greek letter rho is the symbol for density.
3	kg/m^3	Mass in kilograms divided by volume in cubic metres. g/cm^3 is also common in the lab.
4	3000	6 ÷ 0.002 = 3000 kg/m^3, about the density of a dense rock.
5	gas	Gas particles are spread out with lots of empty space, so the same mass fills a much bigger volume.
6	solid	Solid particles vibrate about fixed points - that is why solids keep their shape.
7	stays the same	Mass is conserved in a change of state - the particles are rearranged, not created or destroyed.
8	deposition	Think of frost forming straight from water vapour on a cold car window. The reverse, solid straight to gas, is sublimation.
9	sublimation	Dry ice (solid carbon dioxide) does this at room pressure, making a stage fog.
10	physical	The material gets back its original properties if the change is reversed, so it is physical.
11	internal energy	Kinetic from the particles moving, potential from the forces between them - add both together.
12	temperature	Heating either raises the temperature or changes the state - not both at once.
13	stays the same	The energy goes into breaking bonds between particles, so the heating curve goes flat.
14	potential	Kinetic energy links to temperature. A flat line on a heating curve means only potential energy is rising.
15	specific heat capacity	Water has a very high value, about 4200 J/kg °C, which is why seas warm up slowly.
16	temperature change	θ (theta) is temperature and Δ (delta) means change in.
17	10000	2 × 1000 × 5 = 10 000 J. Multiply mass, specific heat capacity and temperature change.
18	specific latent heat	Latent means hidden: the energy goes in but the thermometer reading does not move.
19	specific latent heat of fusion	Fusion means melting. The liquid to gas one is the latent heat of vaporisation.
20	specific latent heat of vaporisation	Vapour links to vaporisation. It is usually much bigger than the value for melting.

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.

Q	Answer	Remember
21	150000	E = m L, so 0.5 × 300 000 = 150 000 J.
22	J/kg	There is no °C in this unit because the temperature does not change.
23	increases	Temperature of a gas is linked to the average kinetic energy of its particles.
24	increases	Faster particles hit the walls harder and more often, so the force on each square metre rises.
25	The moving particles collide with the walls and each collision exerts a force, giving a total force at right angles to the walls per unit area.	Force from collisions, acting at right angles to the wall - that is pressure.
26	increases	Same particles in less space hit the walls more often. pV stays constant.
27	constant	Halve the volume and the pressure doubles, so the product does not change.
28	300	p1V1 = p2V2, so 100 × 3 = p × 1, giving 300 kPa.
29	increases	Work done on the gas raises its internal energy, which is why a pump barrel feels warm.
30	The work done transfers energy to the gas, increasing the internal energy and so the average kinetic energy of the particles.	Work done is energy transferred - here it ends up in the particles' kinetic store.

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.