

Question 1 (Answer: **D**)

- Heating gives the air particles more kinetic energy, so they move faster.
- They hit the balloon wall more often and harder.
- So both the pressure and the kinetic energy increase.

Question 2 (Answer: **B**)

- Particles held in fixed positions means a solid; mobile particles mean a liquid.
- So the change being described is melting.
- Melting is the *first* flat section of a heating curve, where the temperature holds steady.

Question 1 (Answer: **C**)

- Increasing the pressure squeezes a gas into a smaller space, so the volume decreases.
- Increasing the temperature makes the particles move faster and push out further, so the volume increases.
- So the two changes act in opposite directions on a fixed mass of gas.

1(a)		particle separation	particle arrangement	particle motion
	solid		uniform	vibrate
	liquid	touching	random	random
	gas	apart		
1(b)	M1 melting M2 condensing / condensation M3 dissolving			
1(c)(i)	motion / movement of particles			
1(c)(ii)	relative molecular mass			
1(d)	M1 photochemical smog M2 respiratory problems			
1(e)(i)	carbon monoxide			
1(e)(ii)	nitrogen carbon dioxide			

Question 1 (Answer: **A**)

- Heating gives the molecules more kinetic energy, so they move faster.
- Faster molecules hit the container walls more often and harder.
- The volume is fixed, so the pressure rises – but the number of molecules does not change.

Question 1 (Answer: **C**)

- Melting takes energy in, to overcome the forces holding the molecules in the lattice.
- So the molecules gain energy and can begin to move past one another.
- They are not evaporating (that is liquid to gas) and nothing is dissolving.

Question 2 (Answer: **B**)

- A flat section on a cooling curve is a change of state, with energy still being lost.
- The temperature stays constant because the energy released is exactly offsetting the bonds forming.
- During that plateau both liquid and solid are present together.

Question 2 (Answer: **C**)

- On a cooling curve the sloping parts are one state cooling; the flat parts are a change of state.
- The first plateau is condensation (gas to liquid); the second is freezing (liquid to solid).
- Between the two plateaus the substance is entirely liquid and its temperature is falling.