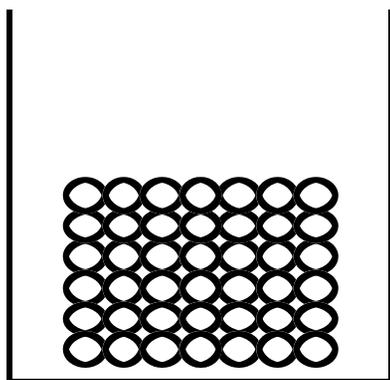
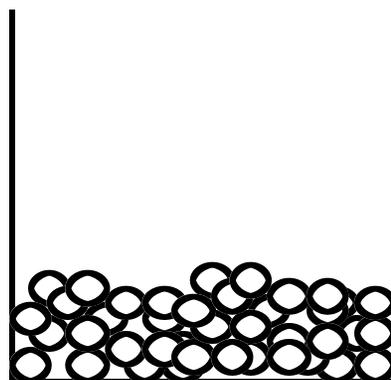


Beneath each of the phase images, write a detailed description of the phase's properties. Be sure to include 1) how the particles behave, 2) what they can and can't do, 3) the forces at work within them, and 4) what characteristics make them different from the other phases.



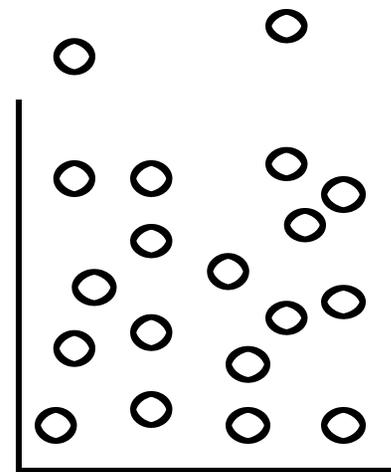
SOLID

Solid particles vibrate in fixed positions. Because their positions are fixed, they have very little freedom. They can move but can't move past each other. As a result they don't take on the shapes of their containers. All of these things are true because solids contain IMF's and high levels of structure. This is what makes them unique.



LIQUID

Liquid particles appear to be in a mosh pit as they collide with neighboring particles and the walls of their container. They do, however, have the freedom to move past each other, so their positions are random. This said, they still contain IMF's so they are not free to leave the container. This is what makes them unique...liquids are bound together but still randomly arranged.



GAS

Gas particles travel in straight lines until they collide with other particles or their container. These particles have high degrees of freedom and very few limitations on what they can do. This is all true because gases do not contain IMF's

Imagine you can see the water molecules inside a block of ice at a temperature below 0°C (the freezing point of water). As you observe the movement and structure of the sample of water, describe the changes you would see as you heat the water to a temperature above 100°C (the boiling point of water). Your “story” should include 5 distinct sections.

When water is below 0°C the molecules are locked together by intermolecular forces (IMF's) into a highly structured solid. As we heat this solid, the molecules vibrate faster and faster in their fixed positions. Eventually, the molecules can no longer vibrate any faster and the structure of the solid collapses. Once the entire structure has collapsed, the water is now a liquid. These liquid molecules move freely and rapidly inside the liquid. As we continue to heat the liquid, the molecules move faster and faster. Eventually, the molecules can't move any faster and the energy added breaks the IMF's within the liquid as the water boils. Once the water becomes a gas, continuing to heat the gas will cause the molecules to travel faster and faster in straight lines as the gas molecules speed up.