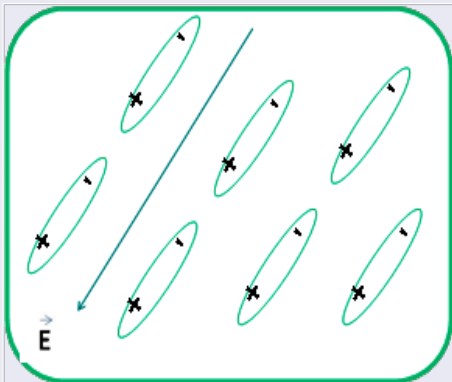


Liquid

- Particles are spread apart
- Particles move slowly through a container



- Particles are tightly packed and close together
- Particles do move but not very much
- Definite shape and definite volume (because particles are packed closely and do not move)
- Most solids are crystals
- Crystals are made of unit cells (repeating patterns)
 - The shape of a crystal reflects the arrangement of the particles within the solid

- **Crystalline material**
- **Single Crystal**
- **Polycrystalline**
- **Amorphous**

- These ordered regions, or single crystal regions, vary in size & orientation with respect to one another.
- These regions are called **grains (or domains)** & are separated from one another by grain boundaries.

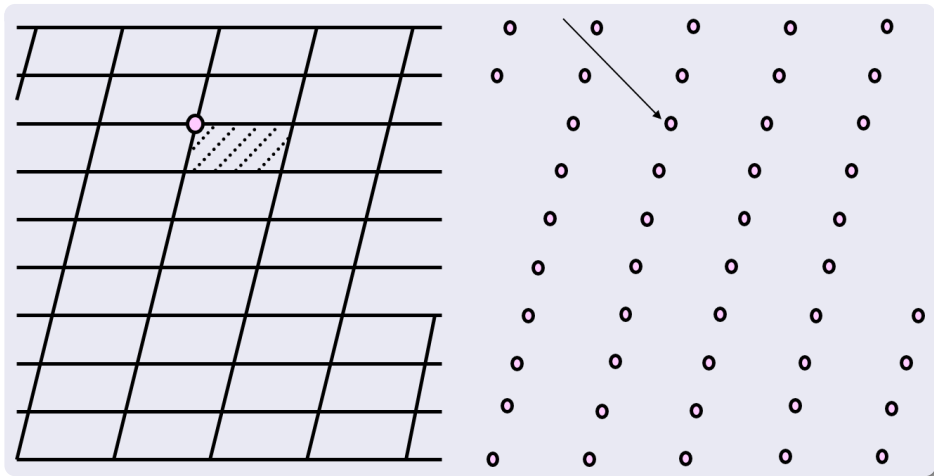
- **Examples of amorphous material include amorphous silicon, plastics, & glasses.**

What about translation?

- Translations are restricted to only certain values to get symmetry (periodicity)

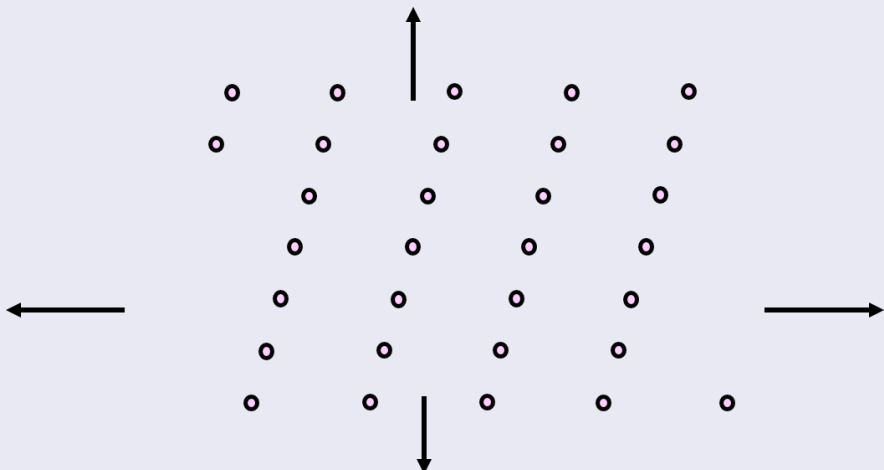


Each block is represented by a point



LATTICE

infinite, perfectly periodic array of points in a space



Summary: Lattice structure

- **An ideal crystal is constructed by the infinite repetition of identical groups of atoms**