Lecture Two

16/10/2022

**Crystal Structure of Material**

* Solid materials may be classified according to the regularity with which **atoms or ions** are arranged with respect to one another.
* A crystalline material is one in which the atoms are situated in a repeating or periodic array over large atomic distances—that is, the atoms will position themselves in a **repetitive three-dimensional pattern**, in which each atom is bonded to its nearest-neighbor atoms.
* **lattice** means a three-dimensional array of points set of mathematical points coinciding with atom positions.
* small groups of atoms form a repetitive pattern. **called unit cells.**
* Unit cells for most crystal structures are **parallelepipeds or prisms.**
* **Amorphous materials** are **those that have no detectable crystal structure**. Amorphous film materials can be formed by: • Deposition of a natural “glassy” material such as a glass composition.

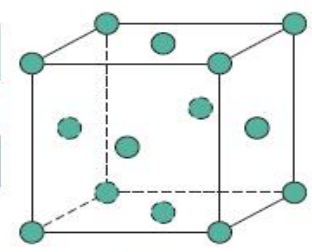
Three relatively simple crystal structures are found for most of the common metals: -

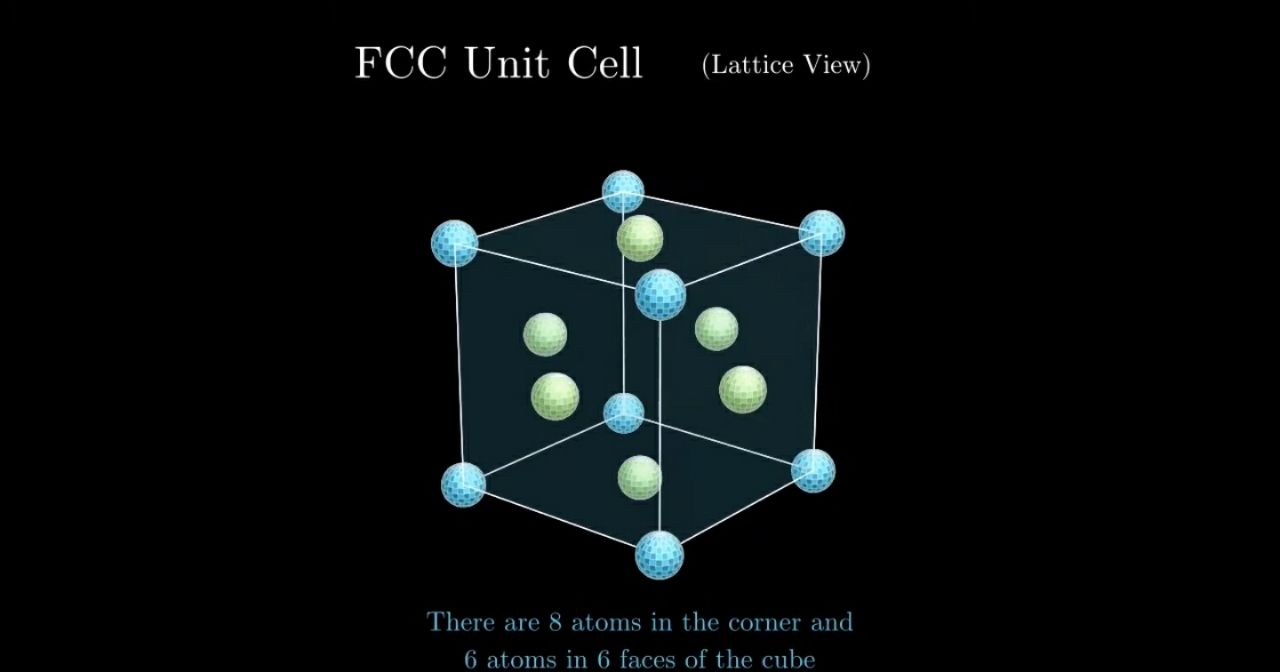
1-Face centered cubic. (F.C.C.)

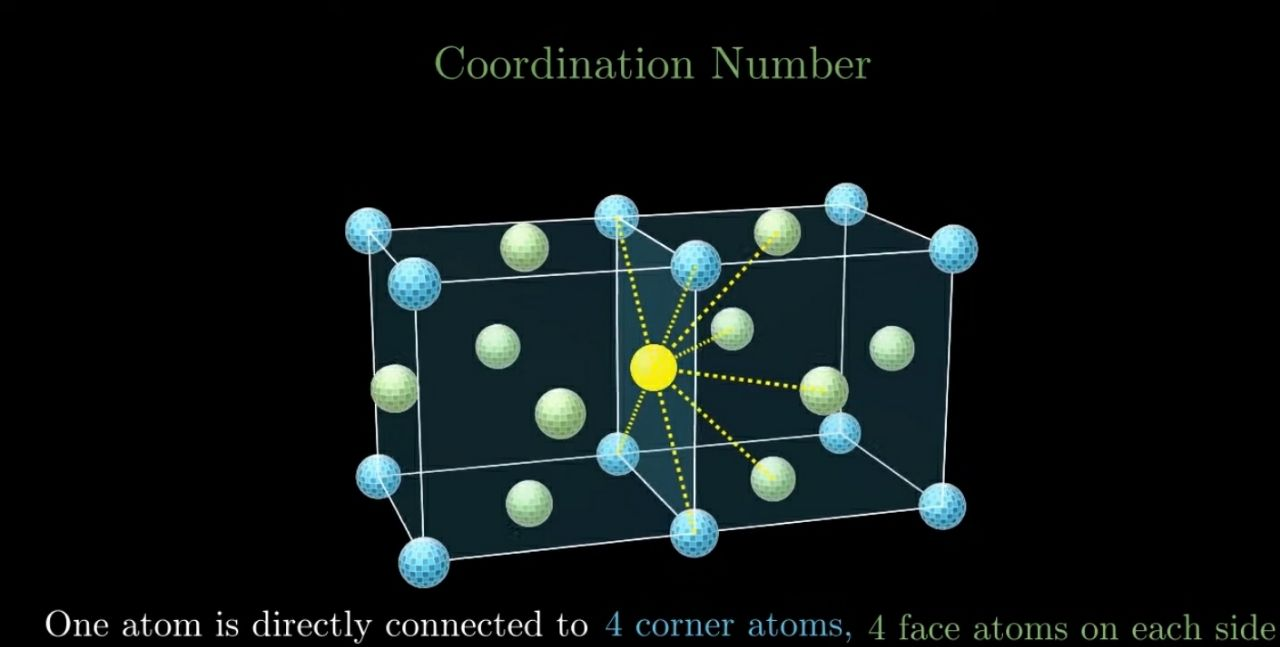
2- Body- centered cubic . (B.C.C.)

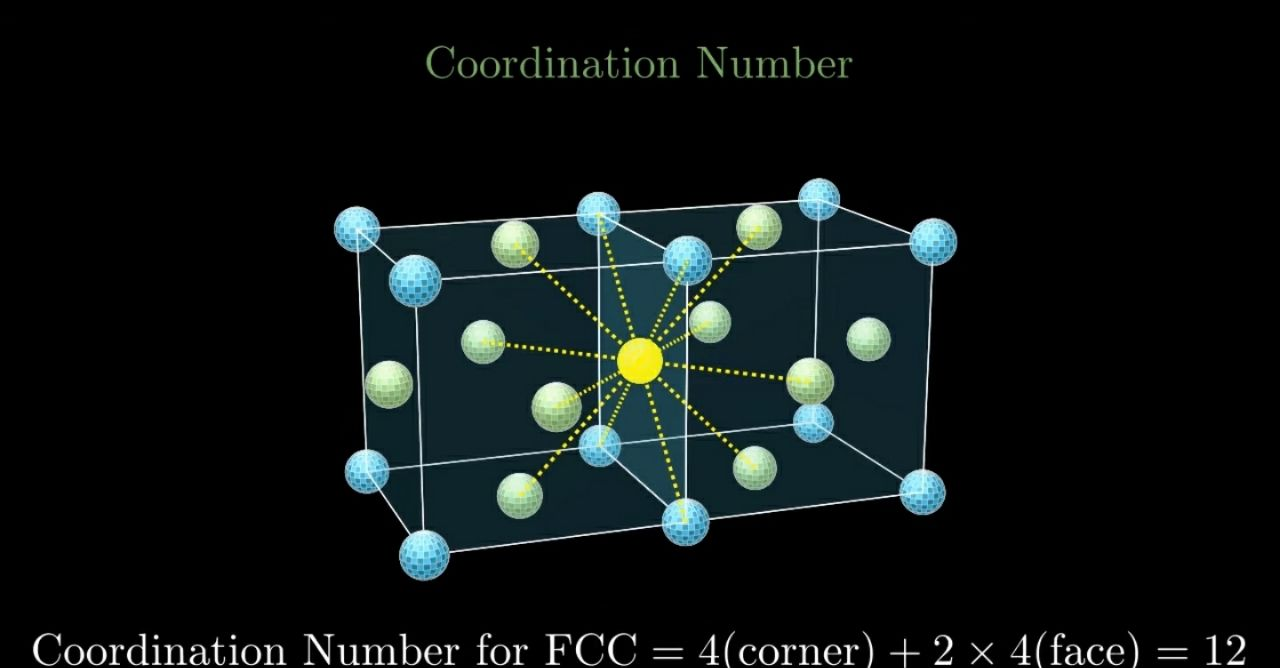
3- Hexagonal close-packed. (H.C.P.)

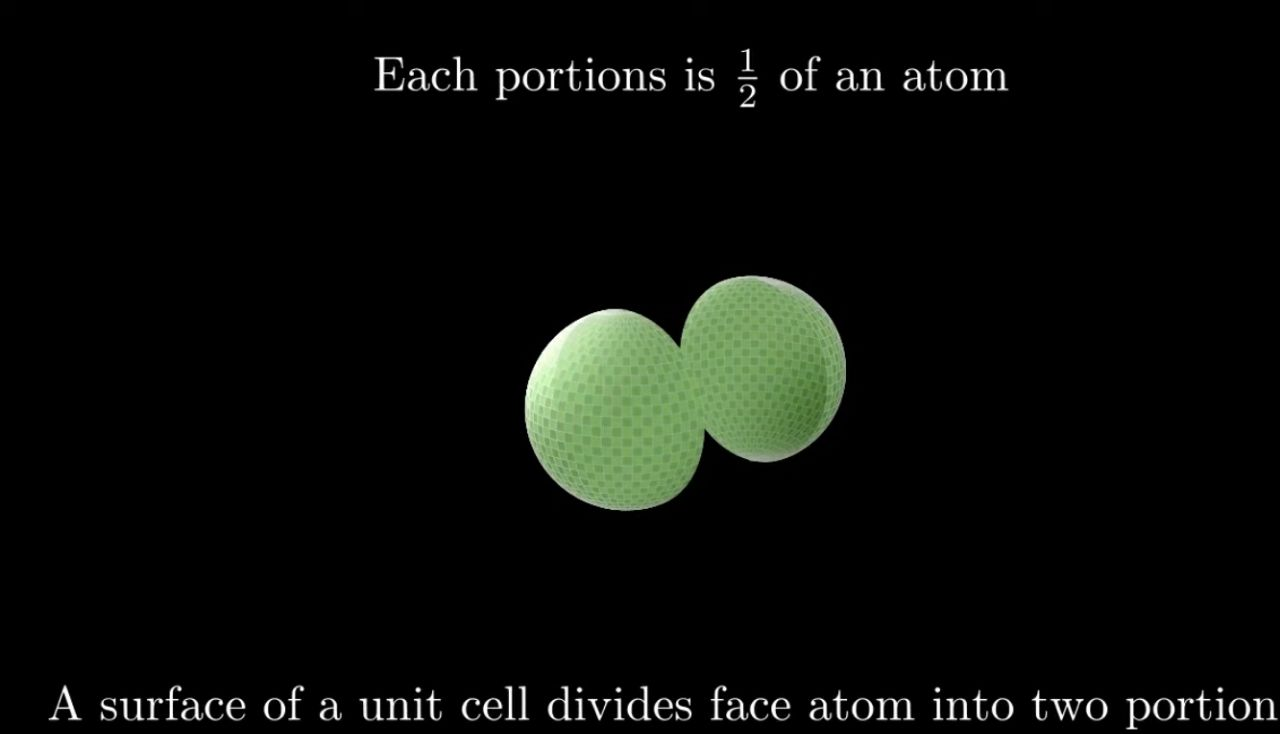
**1-Face centered cubic. (F.C.C.)**

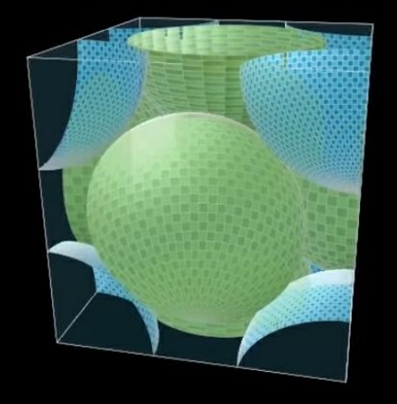


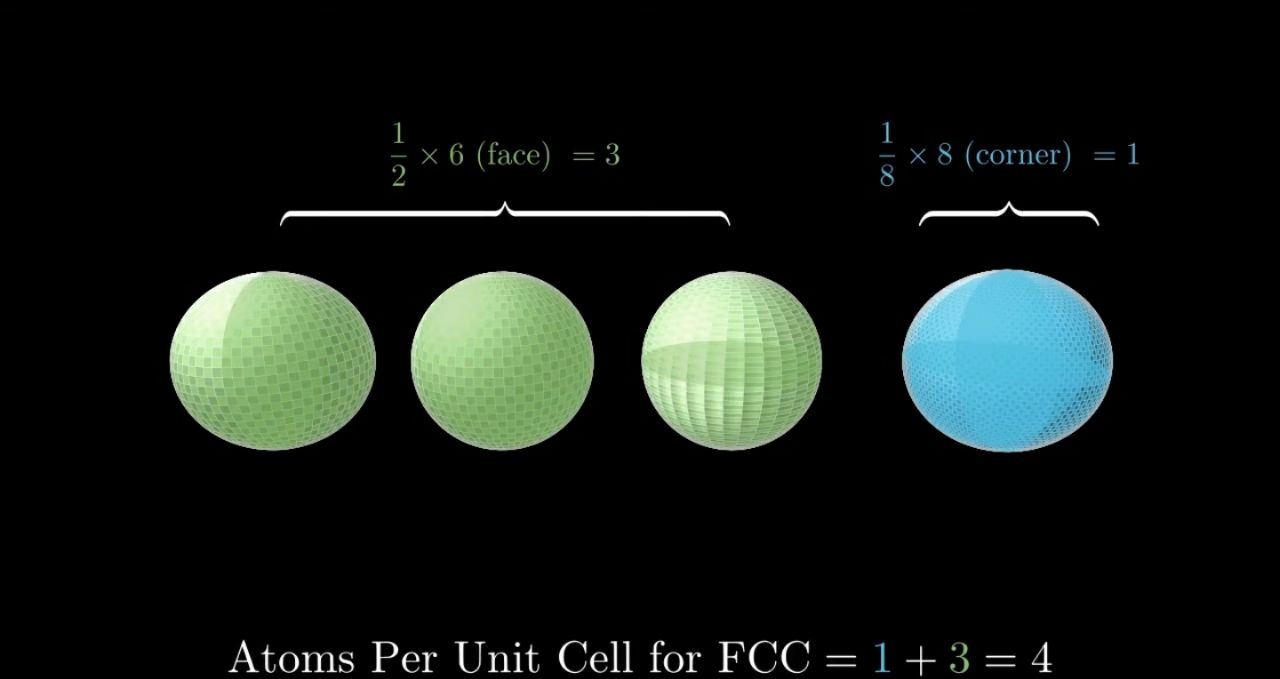


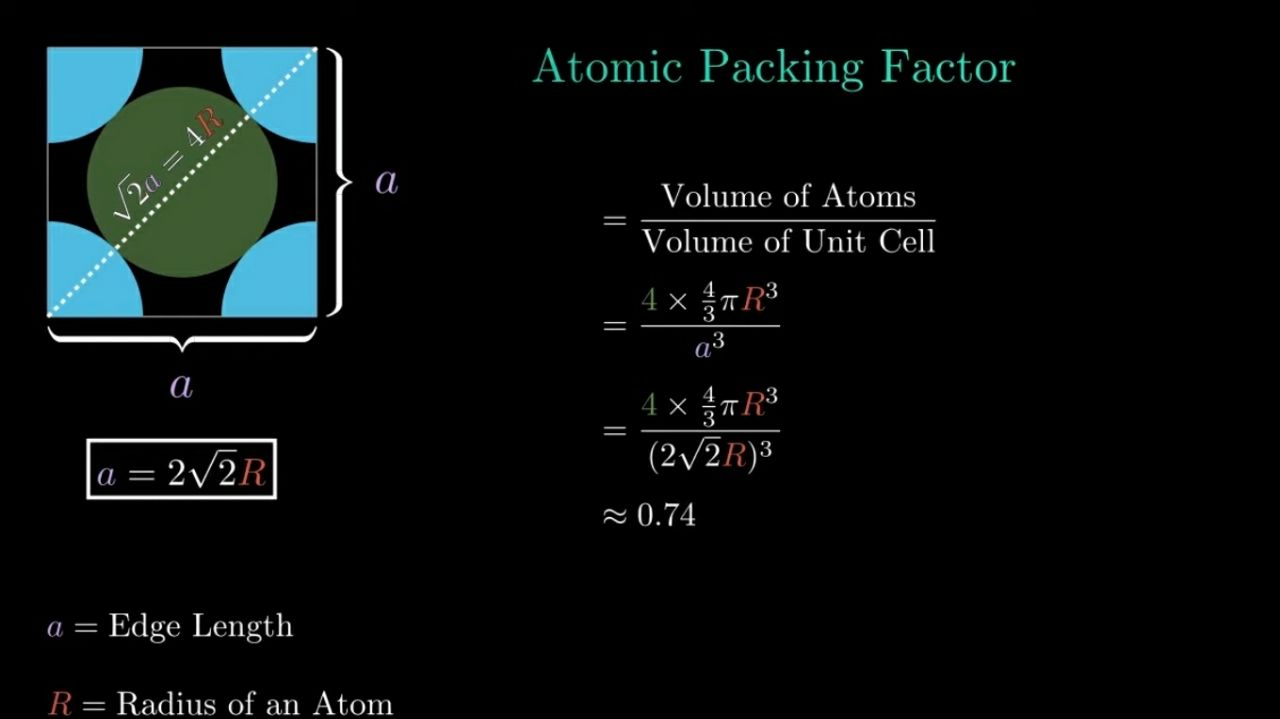












**2- Body Center Cubic (B.C.C)**

