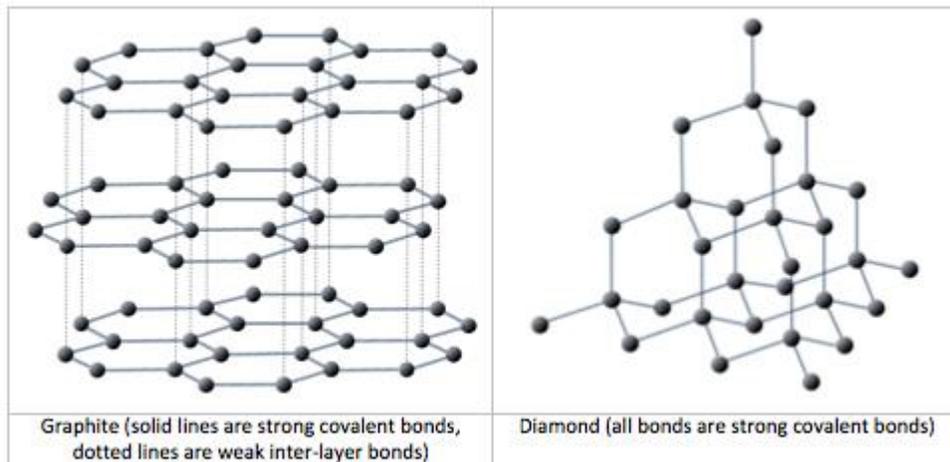


# Minerals and Mineral Properties

The Rice NW Museum teaches about rocks and minerals. What's the difference between the two? A mineral is a single substance while rocks are made of several different kinds of minerals that grow together into a solid substance. So, what are minerals?

Geologists define a mineral as a solid, inorganic, naturally-occurring, homogenous substance with a crystalline-lattice structure. Let's break this down:

- Solid: not a liquid or a gas
- Inorganic: not a plant or animal; also not **made** by a plant or an animal (compare salt and sugar: salt is a mineral because it comes from the mineral halite; sugar is not a mineral because it comes from a plant—sugar cane or sugar beets)
- Naturally-occurring: this means that it comes from nature, that the Earth made it (when we talk about human-made objects such as synthetic diamonds or synthetic emeralds, we call those crystals, not minerals)
- Crystalline-lattice structure: this is the orderly structure that results from the way the atoms line up; they line up in a regular, repeating pattern

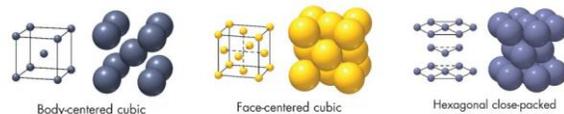


## Crystalline Structure of Metals

Metals are crystalline.

Metal atoms are arranged in very compact and orderly patterns.

Metals can have the following arrangements of atoms:



Minerals have properties or qualities that we can use to help us identify minerals.

- **Habit:** the shape of a mineral
- **Color:** the color we see



- **Streak:** the color of the mineral in powder form; we create a powder by rubbing the mineral against a ceramic streak plate
- **Hardness:** how easy or hard it is for minerals to scratch each other
  - **Mohs Scale:**
    - Scale from 1 – 10; 1 = softest; 10 = hardest

Mohs Hardness Scale			
	Mineral Name	Scale Number	Common Object
↑ Increasing Hardness	Diamond	10	
	Corundum	9	Masonry Drill Bit (8.5)
	Topaz	8	
	Quartz	7	Steel Nail (6.5)
	Orthoclase	6	Knife/Glass Plate (5.5)
	Apatite	5	
	Fluorite	4	Copper Penny (3.5)
	Calcite	3	
	Gypsum	2	Fingernail (2.5)
	Talc	1	

- **Cleavage:** how a mineral breaks when struck by a force from, say, a hammer
- **Density:** similar to how heavy a mineral is although this is not a property of weight; it is a property of how much stuff is packed into a space: e.g. a box stuffed with feathers will be much less dense than the same box filled with marbles