

Solids

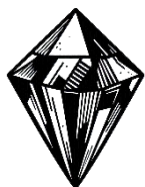
Read from Lesson 3 Solids in the Chemistry Tutorial Section, Chapter 11 of The Physics Classroom

Part a: [Crystalline Solids](#)

Part b: [Amorphous Solids](#)

Part c: [Alloys](#)

Solids are one of the fundamental states of matter, and they can be classified into different types based on how their particles are arranged.



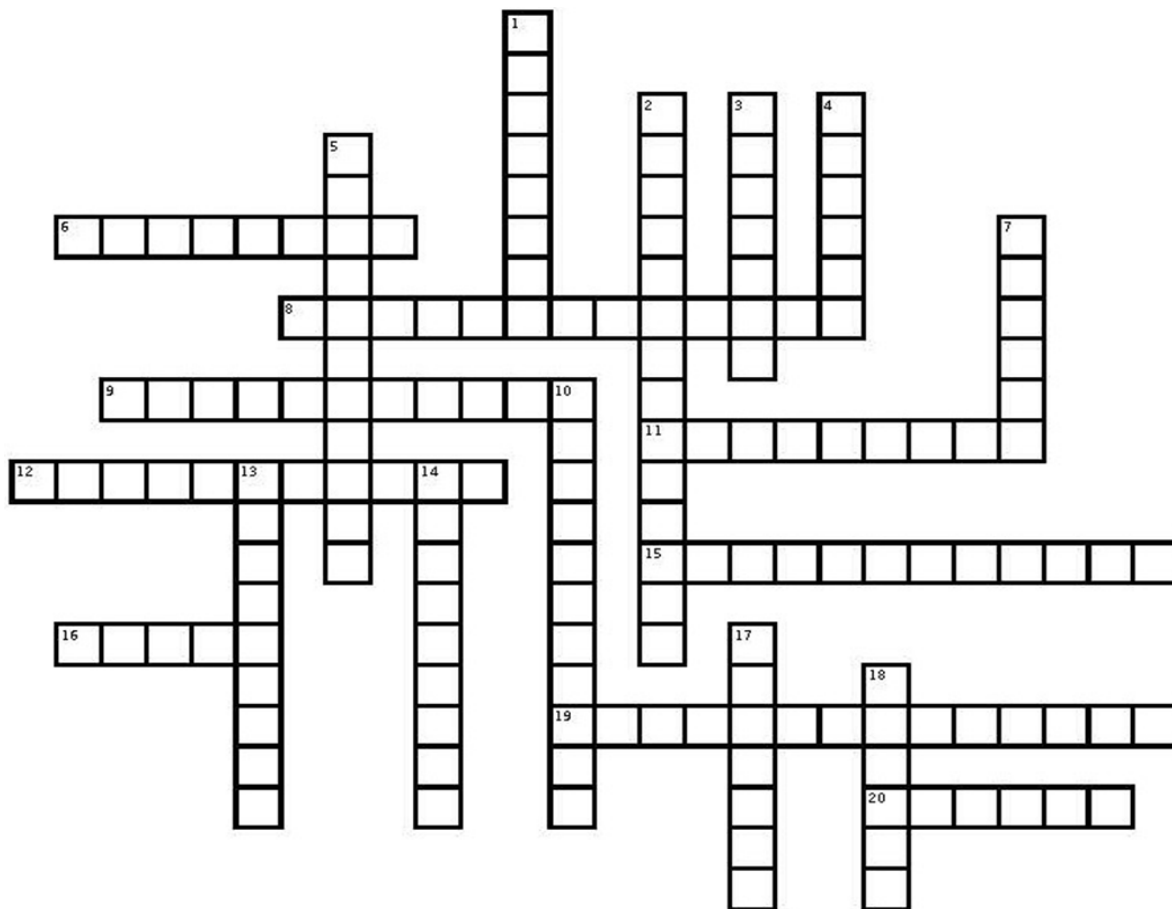
- **Crystalline Solids:** Atoms are arranged in a highly ordered, repeating pattern, resulting in sharp melting points and distinct geometric shapes. Examples: sodium chloride and quartz.
- **Amorphous Solids:** Atoms lack long-range order, leading to irregular shapes and gradual softening upon heating. Examples: glass and plastics.
- **Alloys:** Mixtures of metals (and sometimes nonmetals) designed to have specific properties, such as increased strength or corrosion resistance. Examples: steel and bronze.

Part 1 Solid Questions

1. Crystal Lettuce heats two unknown solids in the lab. The first solid melts sharply at 795°C . The second solid gradually softens around 200°C . Which solid is crystalline and which is amorphous? Explain your reasoning.
2. Diamonds and graphite are both made of carbon, but their properties are quite different. What are these differences? Explain these differences, based on their crystalline structures
3. What are some amorphous materials used in daily life? (Think about your phone or kitchen.) How does their lack of crystalline structure make them useful?
4. A materials scientist is designing a substance to be used in the construction of a bridge in New England where the winters are very cold. This substance needs to be strong, resistant to corrosion, and somewhat flexible. Should the materials scientist use a pure metal or an alloy? Which alloy might be a good choice and why?

Solids, Liquids, and Intermolecular Forces

Part 2 Solid Vocabulary Crossword Puzzle



Down:

1. another name for a homogeneous mixture
2. tightly packed, three-dimensional structure
3. polyethylene is this type manufactured amorphous solid
4. most common manufacturing method for making alloys
5. lowest whole number ratio of ions represented within an ionic compound.
7. solid mixtures of two or more metallic elements
10. model involving valence electrons in metal atoms free to move from atom to atom
13. solid held together by intermolecular forces and made of molecules as its fundamental particle
14. multiple physical forms of the same element
17. type of solid made up of an array of repeating covalently bonded atoms.
18. network solid made of silicon dioxide

Across:

6. repeating unit of a polymer
8. involves heating the rubber polymer with sulfur
9. solids that have a highly organized arrangement of particles
11. type of solid that lacks structure
12. type of particles that can be atoms, ions, or molecules
15. type of alloy where atoms of the alloyed metals are different sizes
16. type of solid made of cations and anions
19. type of alloy where atoms of the alloyed metals are the same size
20. polymer made by combining styrene and butadiene monomer units used in car tires