Activity: Distinguishing Ionic, Molecular, and Atomic Solids

Part 1: Look at the X-Ray Crystallography image of water, what distinguishing features can you cite?

1. _____ 2. _____

Part 2: *Complete the table below for the solids listed.*
Specifically, you are looking for:

A. The types of particles (ions, atoms, or molecules)
B. The connections between those particles (T-connected throughout, S-connected only in some directions, N-no connections between particles).
C. Identify the type of solid that best describes each row and write a brief statement summarizing what the solids in each row have in common.

Type of Solid	**Type of Particles in the Solid** (atom, molecule, ion// metal, non-metal)	**Connections Within and Between Particles in the Solid**	**Generalization Concerning Particle Types and Connections**
Row 1			
1. Argon			
2. Copper			
3. Graphite			
Row 2			
1. Dry Ice (CO_2)			
2. Sulfur (S_8)			
3. Sugar ($C_{12}H_{22}O_{11}$)			
Row 3			
1. Table Salt (NaCl)			
2. Marble ($CaCO_3$)			
3. Baking Soda ($NaHCO_3$)			

Part 3: On a white board, write a set of **"Rules for Identification"** of these 3 categories of solids.

Your Rules for Identification must:

- Allow for correct classification of any substance.
- Identify the type of particles involved in the class of solids.
- Specify the types of connections or lack of connections between particles belonging to this category.

Part 4: Write the "Rules for Identification" of the 3 classes of compounds agreed upon by the class.

Atomic Solids - _____

_____

Molecular Solids - _____

_____

Ionic Solids (Formula Unit Solids) - _____

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