

Name: _____ Date: _____

Answer Key: Dare to Bond: Can You Master 6th Grade Molecular Magic?

Visualize how atoms exchange and share life's fuel through a strategic mix of predictive modeling and pattern recognition challenges.

1. In the crystal structure of Potassium Bromide (KBr), a transfer of one electron creates a bond between a metal and a non-metal. What type of bond is this?

Answer: B) Ionic Bond

Ionic bonds occur when one atom loses an electron to another, resulting in oppositely charged ions that pull toward each other.

2. When two Nitrogen atoms join to form nitrogen gas (N₂), they stay together by ____ valence electrons.

Answer: B) Sharing

Covalent bonds, like those in Nitrogen gas, involve atoms sharing pairs of electrons to reach a stable state.

3. True or False: In a piece of solid Aluminum, the electrons are 'delocalized,' meaning they move freely around many different nuclei.

Answer: A) True

This 'sea of electrons' is the defining characteristic of metallic bonding, allowing metals to conduct electricity.

4. Silver (Ag) is highly malleable, meaning it can be hammered into thin sheets without breaking. Which bonding property allows this?

Answer: C) Mobile metallic 'sea' of electrons

Because metallic bonds aren't rigid, the atoms can slide past each other without the bond snapping.

5. The substance Ammonia (NH₃) is held together by covalent bonds. This means the compound is classified as a ____.

Answer: D) Molecule

A group of atoms held together specifically by covalent bonds is called a molecule.

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6. True or False: Ionic compounds like Lithium Chloride usually have very low melting points and turn into liquids at room temperature.

Answer: B) False

Most ionic compounds have high melting points because the electrical attraction between the ions is very strong.

7. Why do atoms bother to form bonds in the first place?

Answer: C) To reach a stable, full outer electron shell

Most atoms seek to have a full outer shell (often 8 electrons) to achieve the lowest possible energy state.

8. In the compound Sulfur Dioxide (SO₂), atoms are sharing electrons. Based on the Periodic Table, Sulfur and Oxygen are both ____.

Answer: C) Non-metals

Covalent bonds typically form between two or more non-metal atoms.

9. True or False: Oxygen gas (O₂) contains a double bond, which means the two atoms share four electrons total.

Answer: A) True

Each 'bond' represents two shared electrons; therefore, a double bond involves four shared electrons.

10. If an atom of Beryllium (Group 2) loses 2 electrons to become stable, what will its charge be?

Answer: B) +2

Electrons have negative charges. If an atom loses two negative particles, it becomes positively charged (+2).