

# Bonds

Types of Bonds

# Read aloud

The instructor or a student volunteer will read three short stories. After all the three stories have been read, wait thirty seconds.

For each of the stories ask two students to describe them in their own words – emphasizing the type of relationship between the characters.

## **Lily and Sarah**

Two best friends, Lily and Sarah, shared everything from clothes to secrets. Their bond was so strong that they were genuinely considered BFFs by everyone who knew them.

## **Sisters**

The big sister cherished her little sister dearly and showed her love by giving her favorite things to her once she outgrew them. This act of generosity and love strengthened the bond between the two sisters, creating beautiful memories that would last a lifetime.

## **Group of friends**

A group of friends spent all their time together, creating unforgettable memories and sharing plenty of laughter. Their friendship was a source of happiness and fun for all of them.

# Class Brainstorm

For the next three slides, describe the images, describe what is happening, and describe the relationships between the people.







## best friends forever - BFF



### Covalent bond

Two best friends, Lily and Sarah, shared everything from clothes to secrets. Their bond was so strong that they were genuinely considered BFFs by everyone who knew them.

## big sister little sister



### Ionic bond

The big sister cherished her little sister dearly and showed her love by giving her favorite things to her once she outgrew them. This act of generosity and love strengthened the bond between the two sisters, creating beautiful memories that would last a lifetime.

## everyone having fun



### Metallic bond

A group of friends spent all their time together, creating unforgettable memories and sharing plenty of laughter. Their friendship was a source of happiness and fun for all of them.



## best friends forever - BFF



## big sister little sister



## everyone having fun



### Covalent bond

Collaborate

Cooperate

Coordinate

Commitment

A chemical bond formed when electrons are shared between two atoms.

### Ionic bond

Ionic .... Upper and lower case “I”

“I” .... Big sis

“i” ... little sis

a chemical bond formed when one atom gives up one or more electrons to another atom.

### Metallic bond

A metallic bond is a type of chemical bond that occurs between metal atoms. In metallic bonding, valence electrons are free to move throughout the metallic crystal. This creates a 'sea' of electrons that surround the positive metal ions.

# Ways to remember

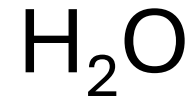
There are three major types of chemical bonds. They are covalent, ionic, and metallic bonds.

The stories and pictures shown can help explain the types of bonds. These may not be the best way for everyone to remember the three different types.

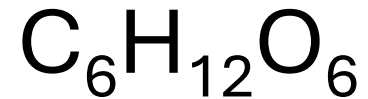
In groups of two or three, think of other ways to remember the names and descriptions.

# Chemistry examples (covalent)

Water



Sugar



## Covalent bond

Two best friends, Lily and Sarah, shared everything from clothes to secrets. Usually, they had bottled water but sometimes they had sugary drinks. Water is an example of a covalent bond between hydrogen and oxygen. Glucose (sugar) is an example of a covalent bond between carbon, hydrogen, and oxygen.

# Chemistry examples (ionic)

Salt



Baking soda



## **Ionic bond**

A big sister cherished her little sister dearly and showed her love by giving her favorite things to her once she outgrew them. She shared other things too, like their grandmothers' secret pizza dough recipe. The recipe uses just a pinch of salt and one teaspoon of baking soda.

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# Chemistry examples (metallic)

Aluminum

Al

Copper

Cu

## **Metallic bond**

A group of friends spent all their time together, creating unforgettable memories and sharing plenty of laughter. One time they made bracelets to share with each other by twisting thin copper wire and pieces of aluminum foil. They passed the bracelets around so that everyone could try them on.

# Material examples

The next three slides show examples of different types of bonds.

Have students create their own stories about the images.

# Covalent bonds: $\text{H}_2\text{O}$ and $\text{C}_6\text{H}_{12}\text{O}_6$

## Water



## Glucose (sugar)



# Ionic bonds: NaCl and NaHCO<sub>3</sub>

## Salt



## Baking soda (sodium bicarbonate)





# Metallic bonds: Al and Cu

## Aluminum



## Copper

