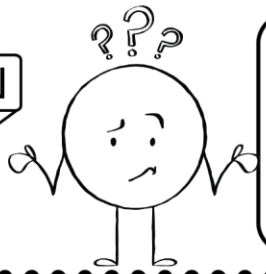
CHEMICAL BONDING



WHY DO BONDS FORM?

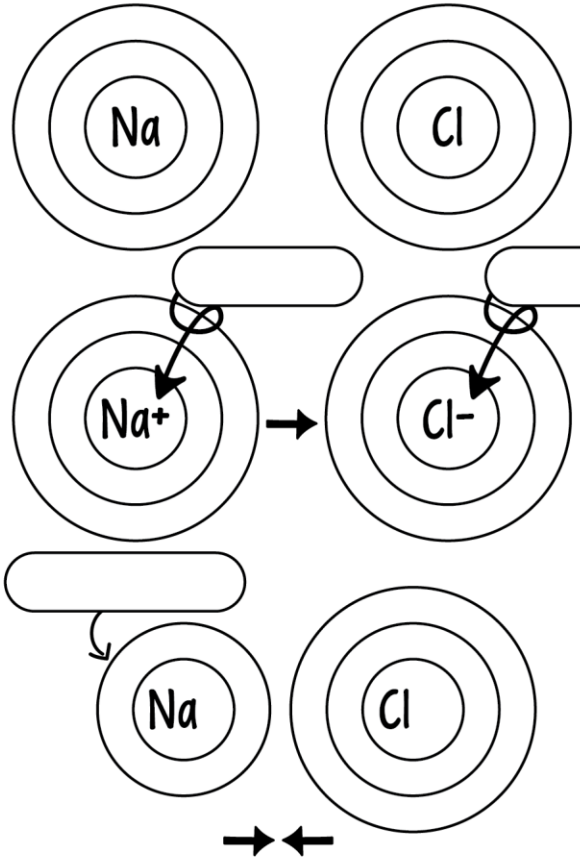
Atoms bond because they become more _____ when they have _____ outer _____. Donating, _____, or sharing _____ allows them to achieve _____. The _____ Rule - 8 electrons in the _____ shell.

IONIC

Ionic bonding occurs when a _____ atom donates one or more _____ to a _____ atom. The metal becomes more _____ (_____) and the non-metal becomes more _____ (_____).

WHAT IS AN ION?

Atoms are normally _____ neutral, same number of _____ & _____. An _____ is an atom that has _____ or _____ an electron.



A sodium atom has _____ outer _____. Chlorine has _____.

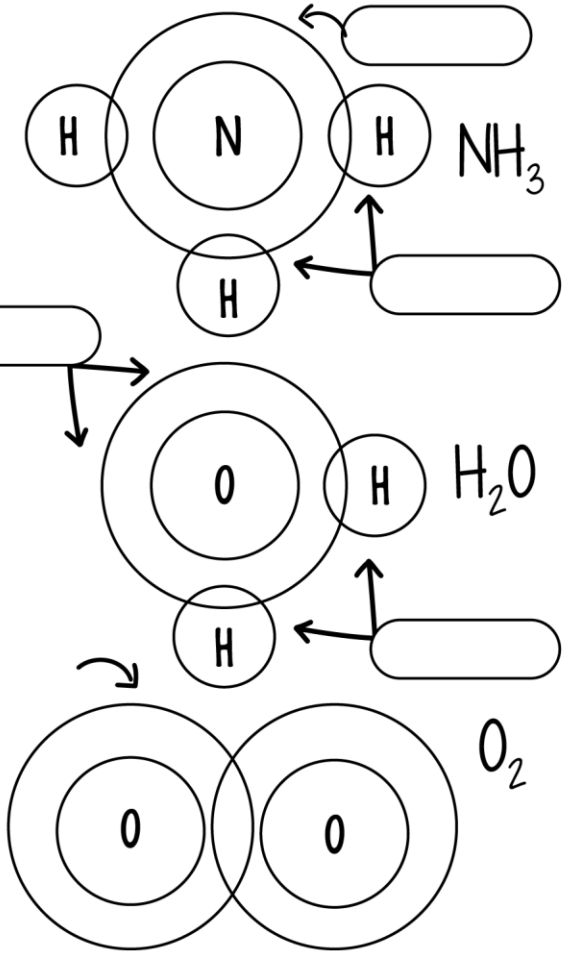
_____ donates its outer electron to the _____ atom.

Now the atoms have _____ charges and _____.

Nitrogen has space for 3 _____. Each hydrogen atom _____ its _____.

Oxygen has space for 2 _____. Each hydrogen atom _____ its _____.

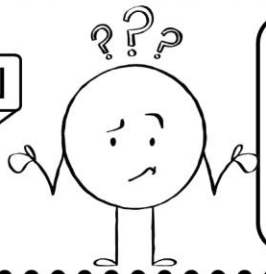
Oxygen has _____ outer electrons. In O_2, each atom _____ 2 electrons.



Covalent bonding occurs when atoms _____ pairs of _____ instead of giving and receiving. The _____ is included in the _____ shell of _____ atoms. Covalent bonding occurs between atoms of _____.

COVALENT

CHEMICAL BONDING

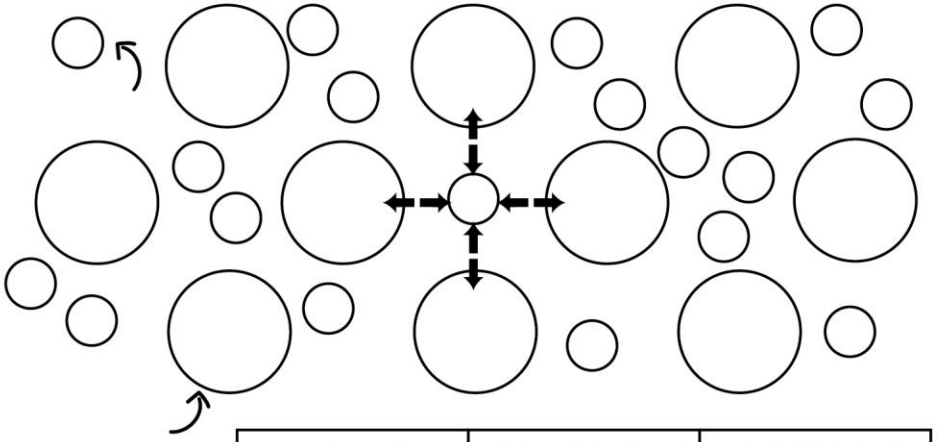


WHAT IS THE DIFFERENCE BETWEEN A COMPOUND AND A MOLECULE?

A compound is two or more _____ elements bonded together. A _____ is two or more _____ bonded together (they don't have to be _____) O_2 is a molecule but not a compound.

METALLIC

Metallic bonds occur when atoms of _____ give up _____ electrons, forming an electron "_____." The _____ charged atoms are _____ through their _____ to the _____ charged electrons.



	IONIC	COVALENT	METALLIC
Electrons			
Bond			
State			
Conductivity			
Melting Point			
Examples			

You try:

What is the most important factor affecting how atoms form chemical bonds? Why?

Atoms of which elements tend to gain electrons? Atoms of which elements tend to lose electrons?

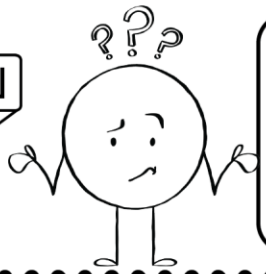
When a Cl atoms gains an electron, it gets a charge of _____ and is known as a(n) _____

What is the Octet Rule?

Identify each of the following as ionic (I) or covalent (C).

C_4H_{10}	Al_2O_3	Na_2S	H_2S
_____	_____	_____	_____
BaF_2	NO_2	CBr_4	$MgCl_2$
_____	_____	_____	_____

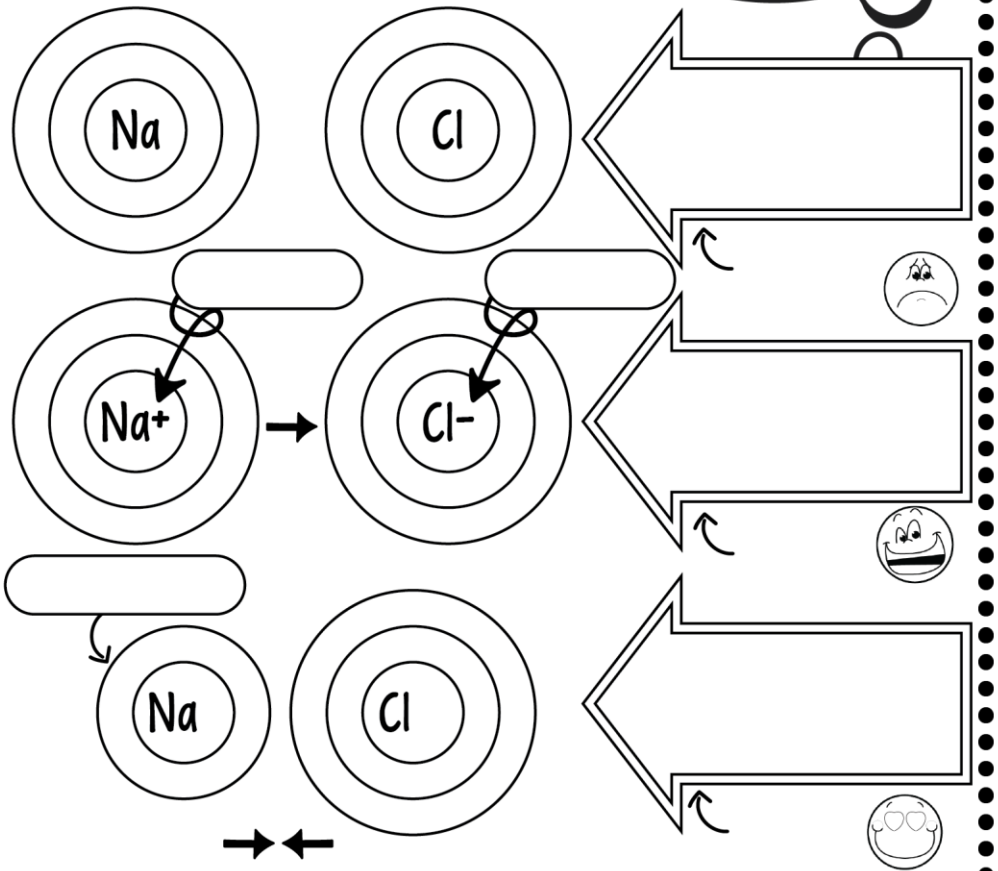
CHEMICAL BONDING



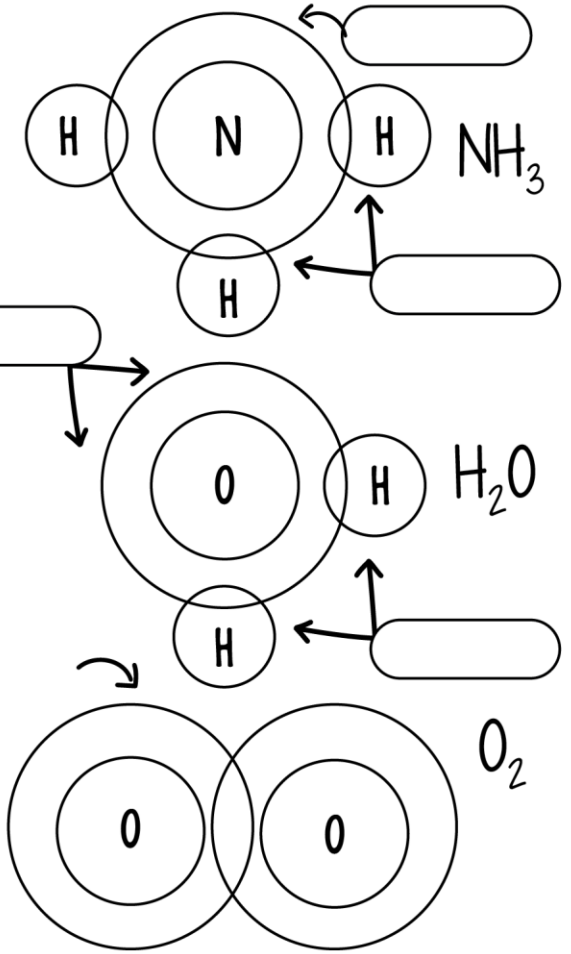
WHY DO BONDS FORM?

IONIC

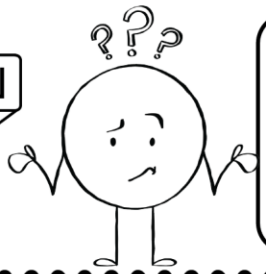
WHAT IS AN ION?



COVALENT

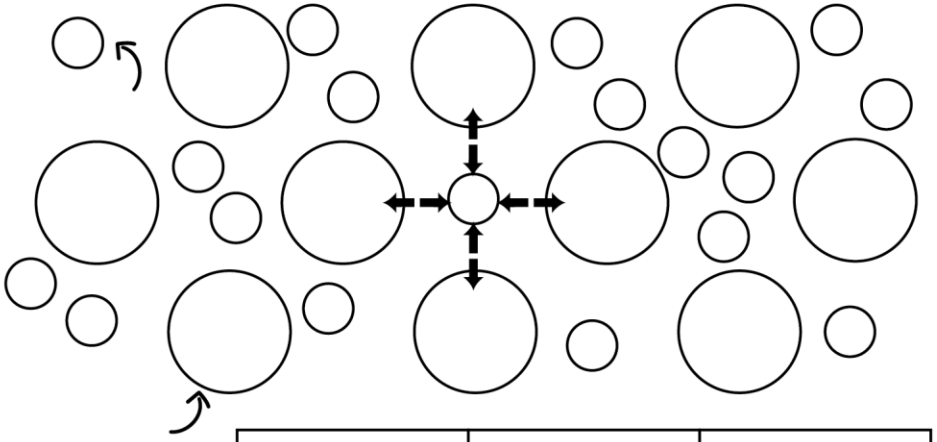


CHEMICAL BONDING



WHAT IS THE DIFFERENCE BETWEEN A COMPOUND AND A MOLECULE?

METALLIC



	IONIC	COVALENT	METALLIC
Electrons			
Bond			
State			
Conductivity			
Melting Point			
Examples			

You try:

What is the most important factor affecting how atoms form chemical bonds? Why?

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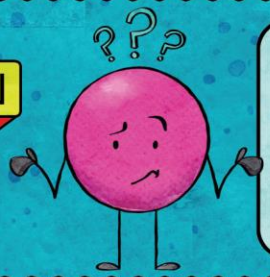
C_4H_{10}	Al_2O_3	Na_2S	H_2S
_____	_____	_____	_____
BaF_2	NO_2	CBr_4	$MgCl_2$
_____	_____	_____	_____

CHEMICAL BONDING



WHY DO BONDS FORM?

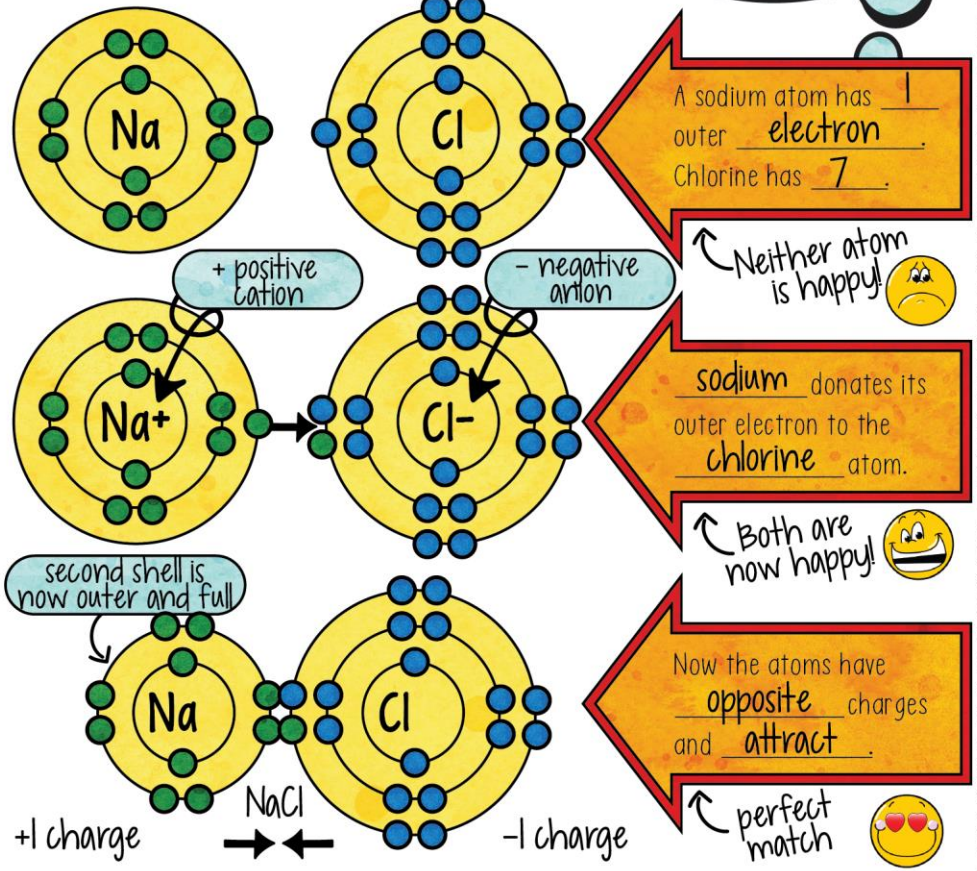
Atoms bond because they become more **stable** when they have **full** outer **shells**. Donating, **receiving**, or sharing **electrons** allows them to achieve **stability**.
The **Octet** Rule - 8 electrons in the **outer** shell.

IONIC

Ionic bonding occurs when a **metal** atom donates one or more **electrons** to a **non-metal** atom. The metal becomes more **positive** (**cation**) and the non-metal becomes more **negative** (**anion**).

WHAT IS AN ION?

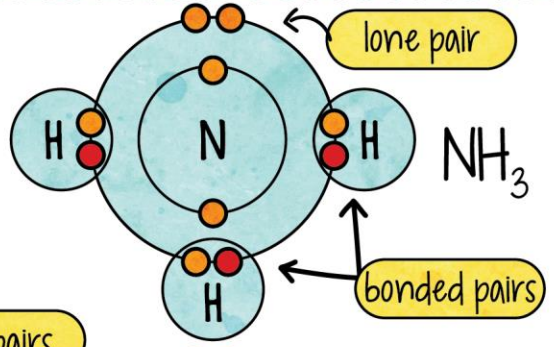
Atoms are normally **electrically** neutral, same number of **protons** & **electrons**. An **ion** is an atom that has **lost** or **gained** an electron.



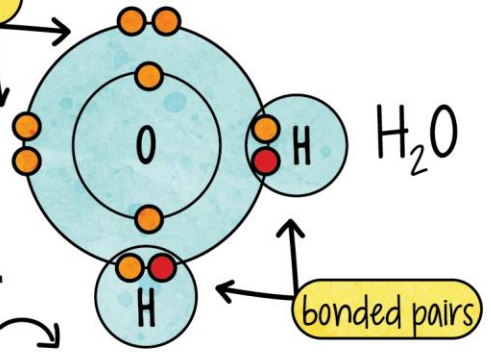
COVALENT

Nitrogen has space for 3 **electrons**. Each hydrogen atom **shares** its **one**.

Lone pairs repel bonded pairs, giving the molecule its shape!

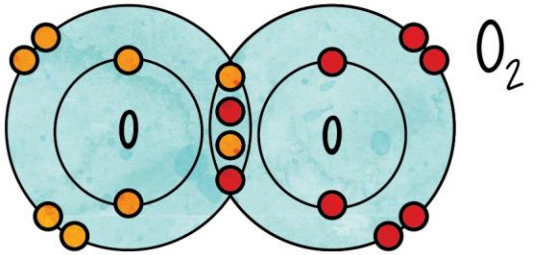


Oxygen has space for 2 **electrons**. Each hydrogen atom **shares** its **one**.



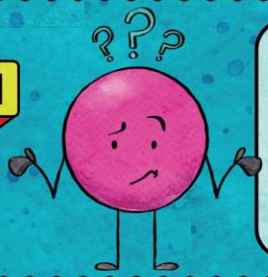
Covalent comes from the prefix "co" which means togeher and valence, outer electrons!

Oxygen has **six** outer electrons. In O_2, each atom **shares** 2 electrons.



Covalent bonding occurs when atoms **share** pairs of **electrons** instead of giving and receiving. The **pair** is included in the **outer** shell of **both** atoms. Covalent bonding occurs between atoms of **non-metals**.

CHEMICAL BONDING

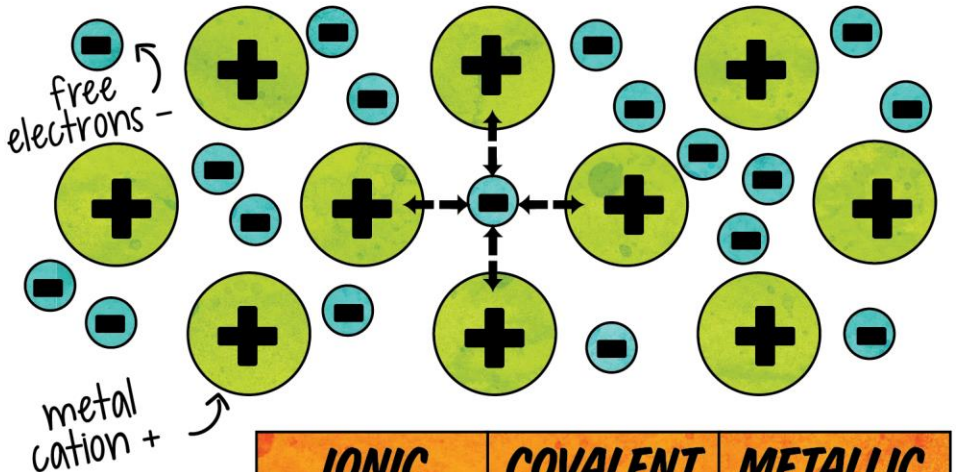


WHAT IS THE DIFFERENCE BETWEEN A COMPOUND AND A MOLECULE?

A compound is two or more **different** elements bonded together. A **molecule** is two or more **atoms** bonded together (they don't have to be **different**) O_2 is a molecule but not a compound.

METALLIC

Metallic bonds occur when atoms of **metals** give up **valence** electrons, forming an electron "**sea**." The **positively** charged atoms are **bonded** through their **attraction** to the **negatively** charged electrons.



	IONIC	COVALENT	METALLIC
Electrons	transferred	shared	electron sea
Bond	metal to nonmetal	nonmetal to nonmetal	metal to metal
State	crystalline solid	solid, liquid or gas	malleable & ductile solid
Conductivity	yes, when aqueous	no	yes
Melting Point	high	low	low
Examples	NaCl, MgO	H_2O, O_2, CO_2	Cu, Al, Au

You try:

What is the most important factor affecting how atoms form chemical bonds? Why?

Valence electrons because they determine how many electrons the atom wants to share, take, or giveaway.

Atoms of which elements tend to gain electrons? Atoms of which elements tend to lose electrons?

Non-metals tend to gain electrons and metals tend to lose electrons

When a Cl atoms gains an electron, it gets a charge of _____ and is known as a(n) _____

It gains a charge of -1 and is known as an "anion"

What is the Octet Rule?

Elements tend to combine in such a way that each atoms has 8 electrons in its outer shell – 2 for hydrogen.

Identify each of the following as ionic (I) or covalent (C).

C_4H_{10}	Al_2O_3	Na_2S	H_2S
C	I	I	C
BaF_2	NO_2	CBr_4	$MgCl_2$
I	C	C	I