Shoot Your Shot!

Modeling Ionic & Covalent Bonding

NAME: **DATE:** **BLOCK:**

PURPOSE: Roll dice to determine, model, and name ionic and covalent compounds.

MATERIALS: Large foam dice (2/partners), colorful dot stickers

PART I: IONIC BONDING

KEY	
Cation Dice Color: _____	**Anion Dice** Color: _____
Be	Se
Na	F
Al	O
Li	Cl
Mg	P
K	S

#1 Assign Dice: Choose one die for the cation and another for the anion. Record their colors in your key.

#2 Roll Dice: Roll both dice simultaneously and record the element names, their valence electrons, and oxidation numbers (charges).

#3 Create a Model: Use dot stickers to show the *transfer* of valence electrons between the elements. Use different colors for each element, draw orbital rings, and use arrows to show electron movement.

#4 Write the Formula: Based on your model, write the chemical formula with the correct subscripts.

#5 Name the Compound: Use ionic naming rules to name the compound. (Write the cation name first, followed by the anion with an "-ide" ending. No prefixes needed!)

PART II: COVALENT BONDING

KEY	
Nonmetal #1 Color: _____	**Nonmetal #2** Color: _____
O	O
N	O
N	O
C	H
C	H
H	H

#1 Assign Dice: Choose one die for nonmetal #1 and another for nonmetal #2. Record their colors in your key.

#2 Roll Dice: Roll both dice and record the element names and their valence electrons.

#3 Create a Model: Use dot stickers to show the *sharing* of valence electrons between the elements. Use different colors for each element, draw orbital rings, and ensure the octet rule is fulfilled (except for hydrogen, which fills at 2).

#4 Write the Formula: Based on your model, write the chemical formula with the correct subscripts.

#5 Name the Compound: Use covalent naming rules. (Add prefixes to indicate the number of each atom, and add "-ide" to the second element's name. If there's only one atom of the first element, no prefix is needed.)

Prefixes:

1 - mono	*2 - di*	*3 - tri*	*4 - tetra*	*5 - penta*
6 - hexa	*7 - hepta*	*8 - octa*	*9 - nona*	*10 - deca*

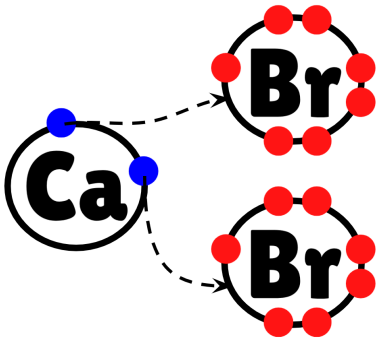
Shoot Your Shot!

Modeling Ionic & Covalent Bonding

PART I: IONIC BONDING *(EXAMPLE)*

Cation	Anion
Element Name: **Calcium**	Element Name: **Bromine**
# Valence Electrons: **2**	# Valence Electrons: **7**
Oxidation Number (Charge): **2+**	Oxidation Number (Charge): **1-**

Lewis Dot Model

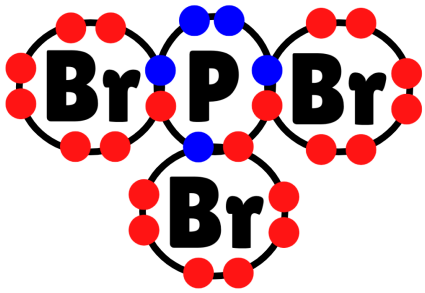


Chemical Formula: **$CaBr_2$** Compound Name: **Calcium Bromide**

PART II: COVALENT BONDING *(EXAMPLE)*

Nonmetal #1	Nonmetal #2
Element Name: **Phosphorus**	Element Name: **Bromine**
# Valence Electrons: **5**	# Valence Electrons: **7**

Lewis Dot Model



Chemical Formula: **PBr_3** Compound Name: **Phosphorus Tribromide**

Shoot Your Shot!

Modeling Ionic & Covalent Bonding

PART I: IONIC BONDING (COMPOUND 1)

Cation	Anion
Element Name:	Element Name:
# Valence Electrons:	# Valence Electrons:
Oxidation Number (Charge):	Oxidation Number (Charge):
Lewis Dot Model	
Chemical Formula:	Compound Name:

Shoot Your Shot!

Modeling Ionic & Covalent Bonding

PART I: IONIC BONDING (COMPOUND 2)

Cation	Anion
Element Name:	Element Name:
# Valence Electrons:	# Valence Electrons:
Oxidation Number (Charge):	Oxidation Number (Charge):
Lewis Dot Model	
Chemical Formula:	Compound Name:

Shoot Your Shot!

Modeling Ionic & Covalent Bonding

PART II: COVALENT BONDING (COMPOUND 1)

Nonmetal #1	Nonmetal #2
Element Name: # Valence Electrons:	Element Name: # Valence Electrons:
Lewis Dot Model	
Chemical Formula:	Compound Name:

Shoot Your Shot!

Modeling Ionic & Covalent Bonding

PART II: COVALENT BONDING (COMPOUND 2)

Nonmetal #1	Nonmetal #2
Element Name: # Valence Electrons:	Element Name: # Valence Electrons:
Lewis Dot Model	
Chemical Formula:	Compound Name: