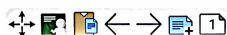
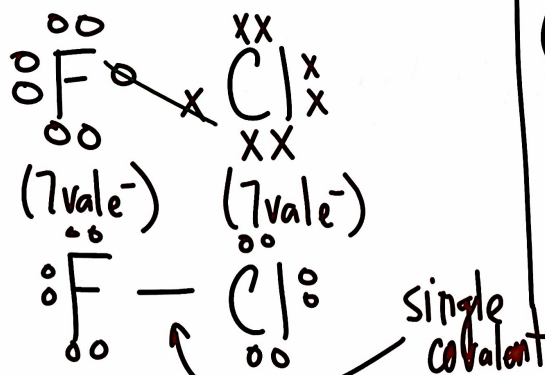


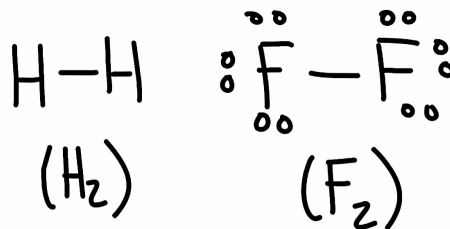
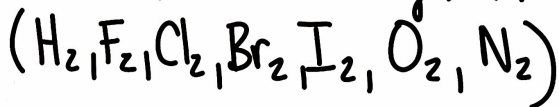
## Covalent Bond

Connection (Bond) between two atoms due to share  $e^-$ .

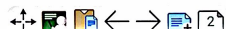
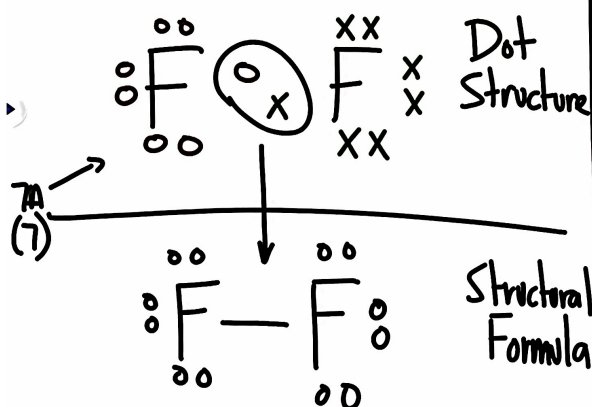


## Diatomic Element

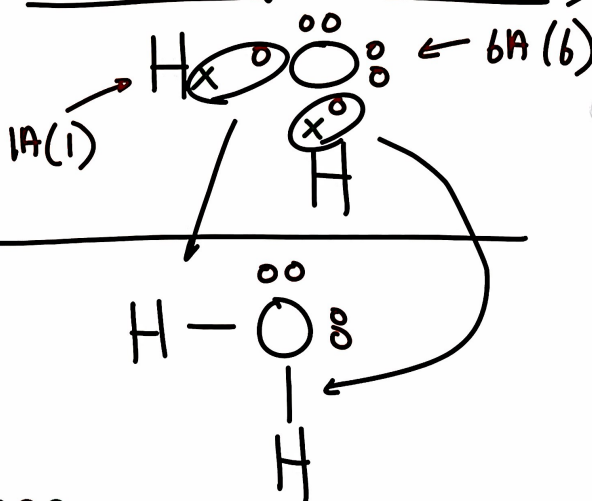
Two (or more) atoms of an element bonded together.



## $F_2$ (Diatomic Fluorine)



## $H_2O$ (dihydrogen monoxide)



# Multiple Covalent Bonds

1A(1)

1 val<sup>e-</sup>

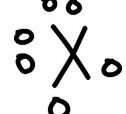
4A(4)

4 val<sup>e-</sup>

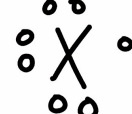
5A(5)

5 val<sup>e-</sup>

6A(6)

6 val<sup>e-</sup>

7A(7)

7 val<sup>e-</sup>

Each single dot can form a single bond

Form mult. bonds

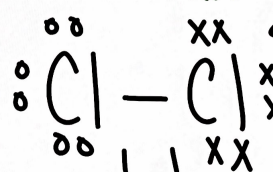
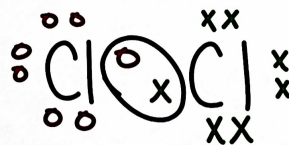
|               |                     |                     |                      |               |
|---------------|---------------------|---------------------|----------------------|---------------|
| 1 single bond | 4 single, 2 double  | 1 double + 1 single | 1 double or 2 single | 1 single bond |
|               | 1 triple + 1 single | 1 triple            |                      |               |



Single Bond : Sharing of 2 (pair) of e<sup>-</sup>  
From 2 atoms

H<sub>2</sub> (diatomic Hydrogen)

↑  
single covalent bond  
(share)

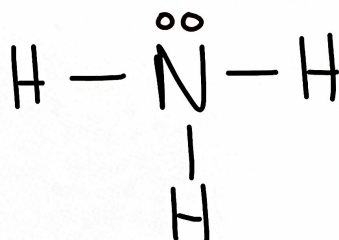
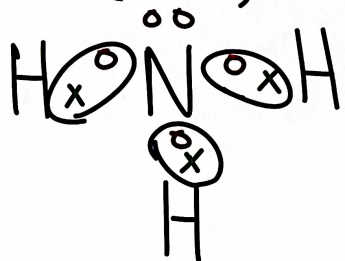
Cl<sub>2</sub> (diatomic chlorine)2 val<sup>e-</sup>

8 val<sup>e-</sup>  
total  
(7 + 1)



Single Bond : Sharing of 2 (pair) of  $e^-$   
From 2 atoms

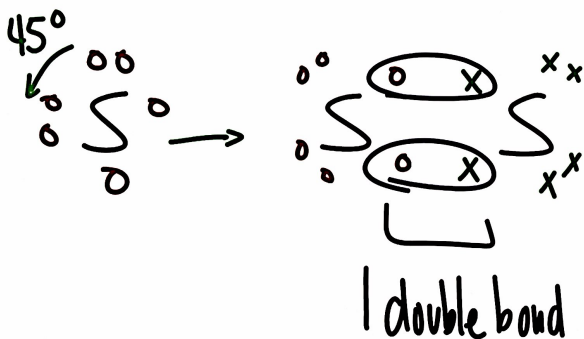
$\text{NH}_3$  (ammonia, nitrogen trihydride)  
(central)



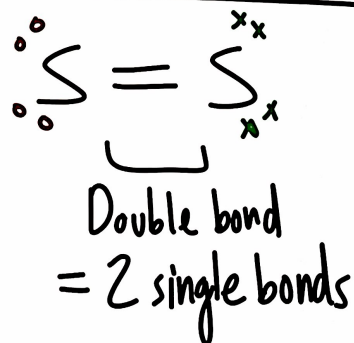
3 single bonds

Double Bond - Sharing of 4 val.  $e^-$  between two atoms

Sulfur ( $\text{S}_2$ )



Double is 2x stronger  
than single

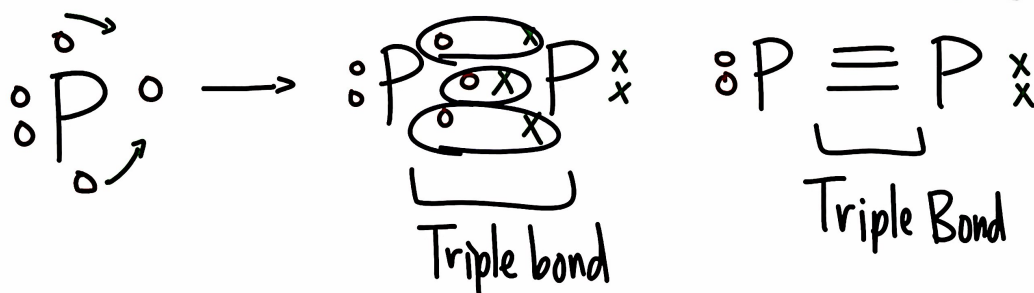


Triple Bond - Sharing of 6 val.  $e^-$  between two atoms

Feb-15-2024 8:51 PM 5/6

$P_2$  (Phosphorous)

Triple is 3.x stronger than single



Carbon (up to 4 single bonds)

$\begin{array}{l} \text{2 double} \\ \text{1 triple + 1 single} \\ \text{1 double + 2 single} \end{array}$

Feb-15-2024 8:52 PM 6/6

CH<sub>4</sub> (methane)

H<sub>2</sub>CS

