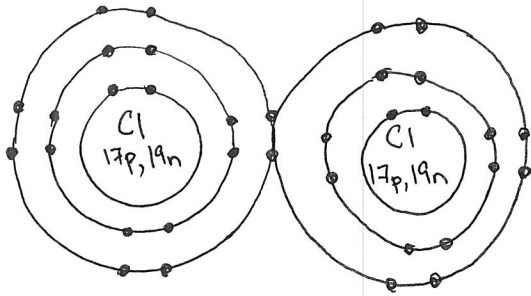


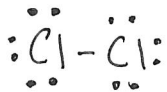
1a) Cl_2

i) covalent

ii)

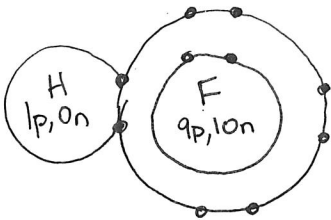


iii)

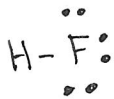


1b) HF (covalent)

ii)



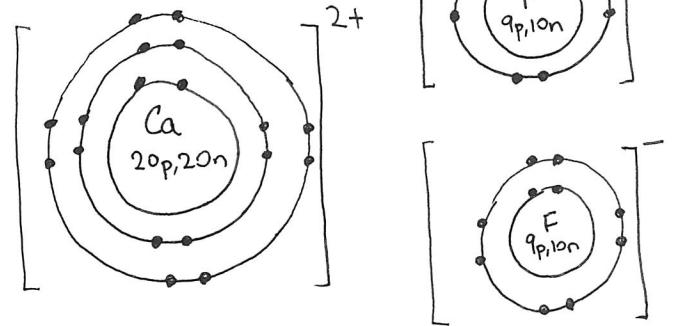
iii)



1c) CaF_2

i) ionic

ii)



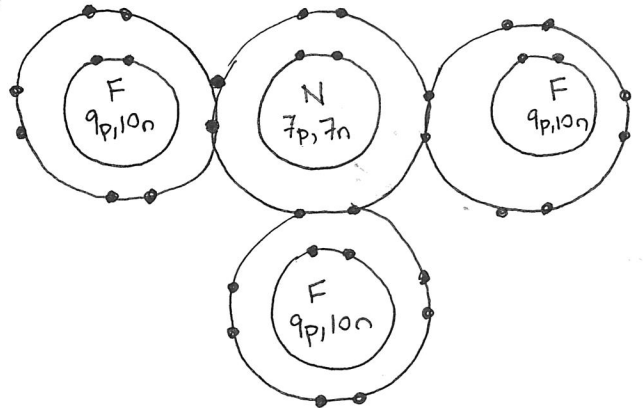
iii)



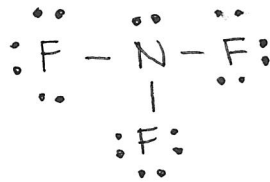
1d) NF_3

i) covalent

ii)



iii)



2. Complete the following table.

	Chemical Formula	Total Valence Electrons	Lewis Diagram	# Lone Pairs	# Bonding Pairs
a)	CH ₄	8	$\begin{array}{c} \text{H} \\ \\ \text{H}-\text{C}-\text{H} \\ \\ \text{H} \end{array}$	0	4
b)	O ₂	12	$:\ddot{\text{O}}=\ddot{\text{O}}:$	4	2
c)	NH ₃	8	$\begin{array}{c} \cdot \\ \cdot \\ \text{H}-\text{N}-\text{H} \\ \\ \text{H} \end{array}$	1	3
d)	SiH ₄	8	$\begin{array}{c} \text{H} \\ \\ \text{H}-\text{Si}-\text{H} \\ \\ \text{H} \end{array}$	0	4
e)	CN ⁻	4+3+1 =8	$[:\text{C}\equiv\text{N}:]^{-}$	2	3
f) *	C ₂ H ₄	12	$\begin{array}{c} \text{H} \\ \\ \text{H}-\text{C}=\text{C}-\text{H} \\ \\ \text{H} \end{array}$	0	6
g) *	CO ₃ ²⁻	4+3(6) +2= 24	$\left[\begin{array}{c} \cdot \\ \cdot \\ :\ddot{\text{O}}-\text{C}=\ddot{\text{O}}: \\ \\ :\ddot{\text{O}}: \end{array} \right]^{2-}$	8	4

*Challenge: optional

3. Explain why the diatomic elements (H, I, Br, O, N, Cl, F) exist in nature as covalent compounds H₂, I₂, Br₂, O₂, N₂, Cl₂, F₂.

- all are non-metals and can therefore form covalent compounds.
 - lone unpaired electrons on each atom can form covalent bonds with corresponding lone unpaired electrons on other atom to complete both atoms' valence shells via single, double, or triple bonds.
- ↳ Note: does not work for C or Si, since "quadruple bonds" do not exist.