

## A stepwise approach to perfect Lewis structures\*

**Step 1:** Arrange atoms in space based on connectivity given in molecular formula.

**Step 2:** Add single bonds to all atoms that are connected to each other.

**Step 3:** Identify all carbon atoms without a filled valence shell. For each such carbon atom, look for an adjacent atom that is also without a filled valence and connect with one or two multiple bonds.

**Step 4:** Add lone pairs to fill all remaining unfilled valence shells.

**Step 5:** Add any formal charges as identified by the table presented during the first lecture.

\*This works for all but molecules with a carbocation. Do not worry about those at this time.

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### Valence Electrons in Neutral Atoms:

H	C	N	O	F,Cl,Br,I
1	4	5	6	7

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### Formal Charge Identification:

Atom	# electrons in the valence shell	Neutral		Positive Charge		Negative Charge	
		Bonds	Lone Pairs	Bonds	Lone Pairs	Bonds	Lone Pairs
H	2	1	0	0	0	0	1 (rare)
C	8	4	0	3	0	3	1
N	8	3	1	4	0	2	2
O	8	2	2	3	1	1	3
F,Cl,Br,I	8	1	3	-	-	0	4

