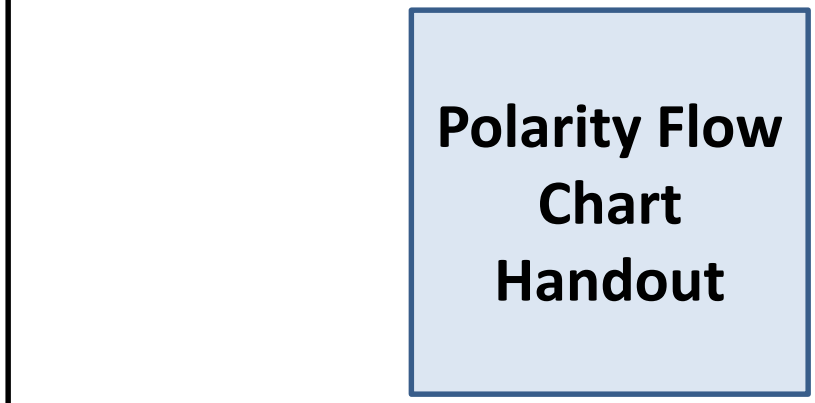
Target: I can identify polarity of molecules

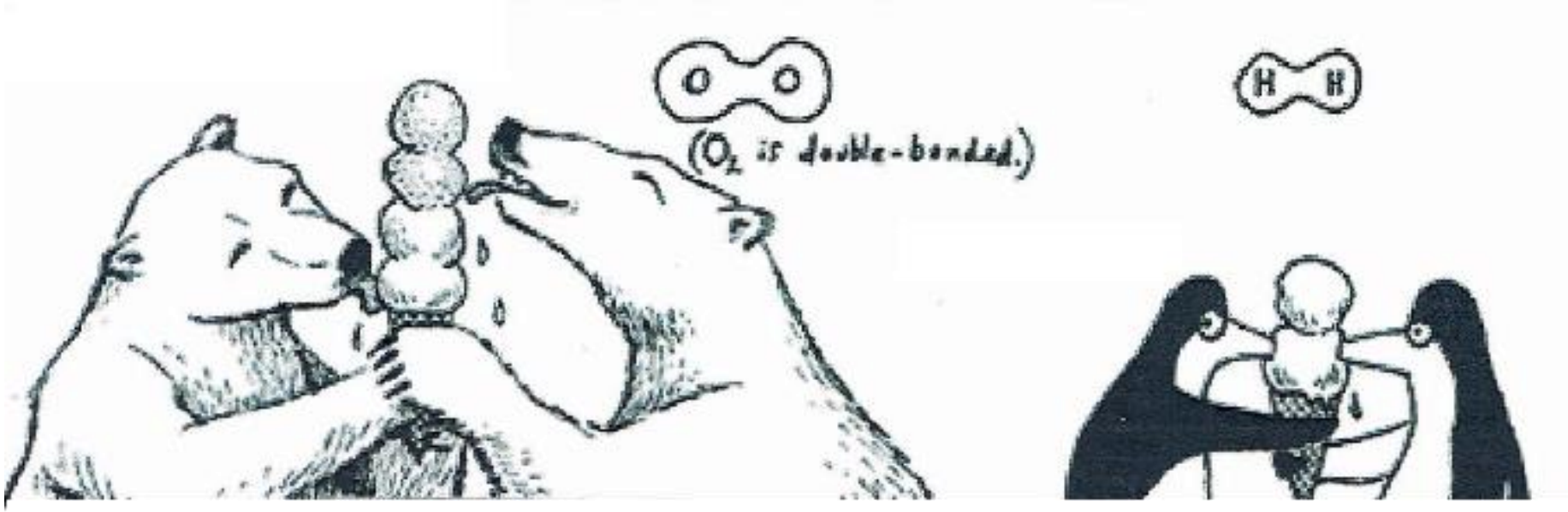


K	C	Q

Polarity

What's happening inside covalent molecules like O_2 or H_2?

Electrons are shared *equally*



Example: HF

HF is covalent but electrons are *not* shared equally

Molecules become *POLAR* when electrons are not shared equally

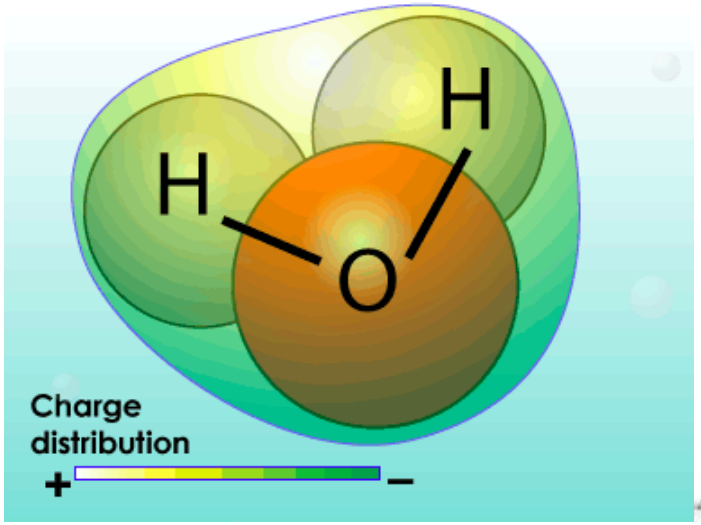
Polar molecules with more than 2 atoms

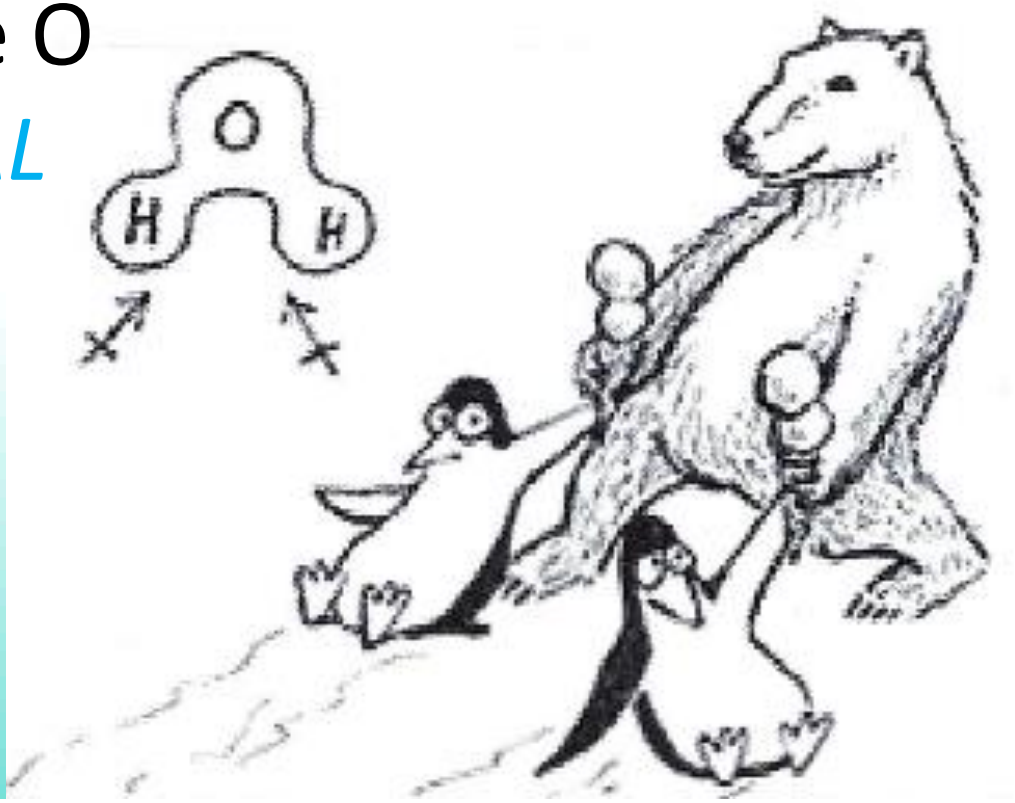
Water has:

2 H's willing to almost give up electrons

1 electronegative O

Ends up UNEQUAL

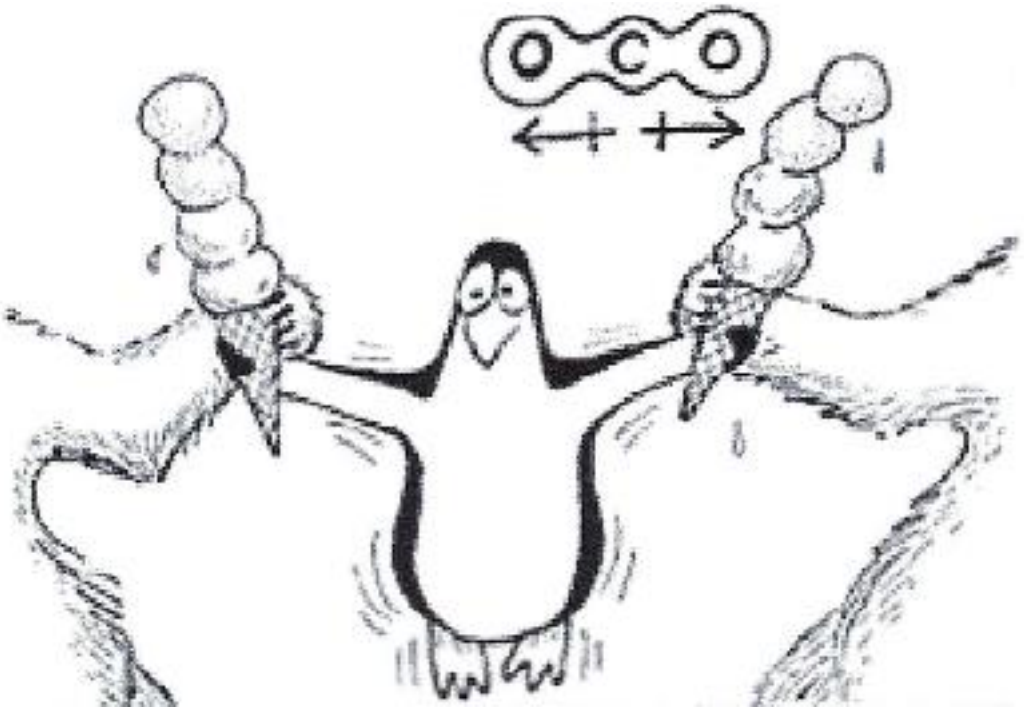




Symmetry…the pole destroyer!

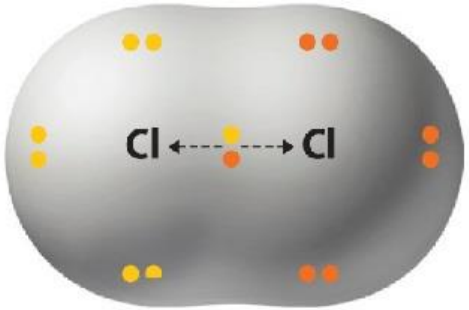
CO_2

Has 1 carbon surrounded by 2 electronegative Oxygens, but is NOT polar?!?!



Electron density is still SYMETRICAL which makes it non-polar

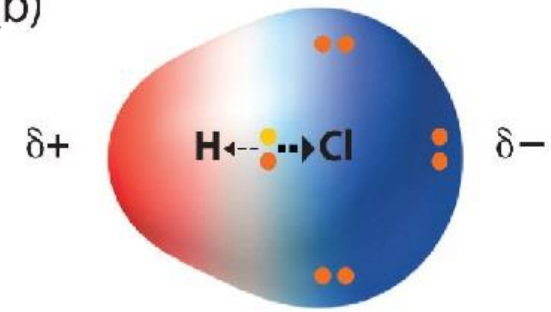
(a)



Nonpolar covalent bond

Bonding electrons shared equally between two atoms.
No charges on atoms.

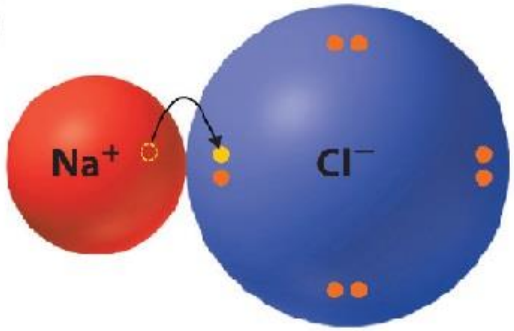
(b)



Polar covalent bond

Bonding electrons shared unequally between two atoms.
Partial charges on atoms.

(c)

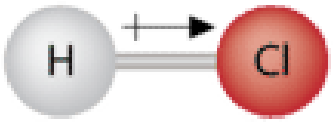


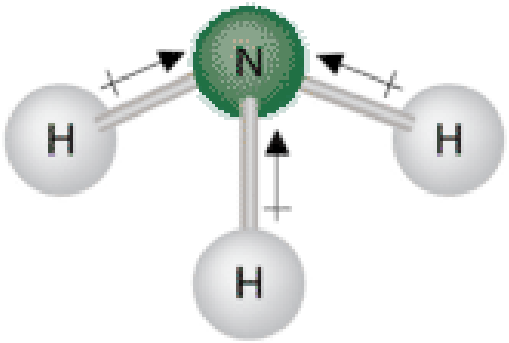
Ionic bond

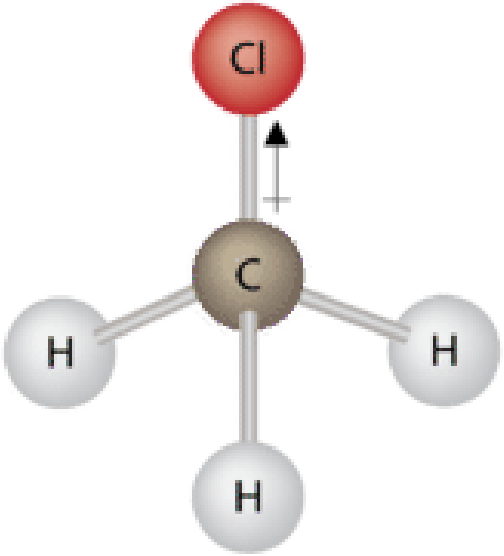
Complete transfer of one or more valence electrons.
Full charges on resulting ions.

Careful about polar BOND versus polar MOLECULE

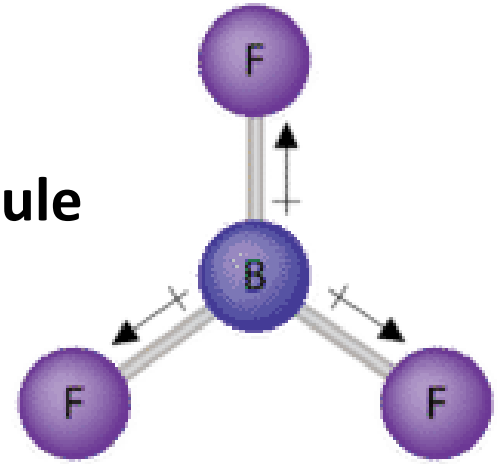
Polar bond AND Polar molecule

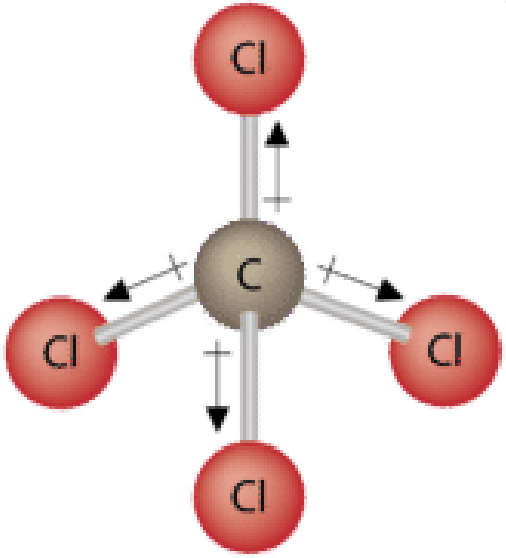




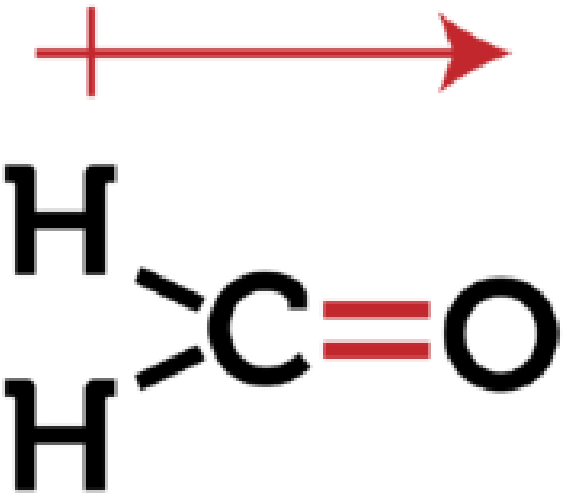


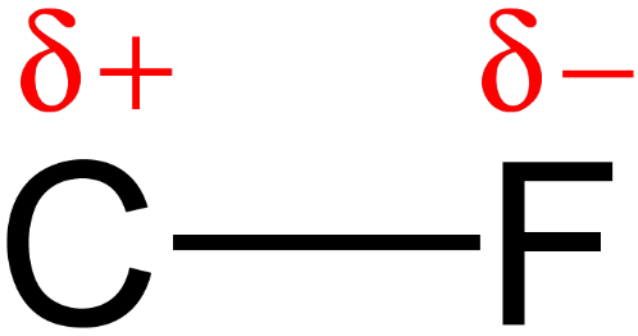
Polar bond AND NON-polar molecule

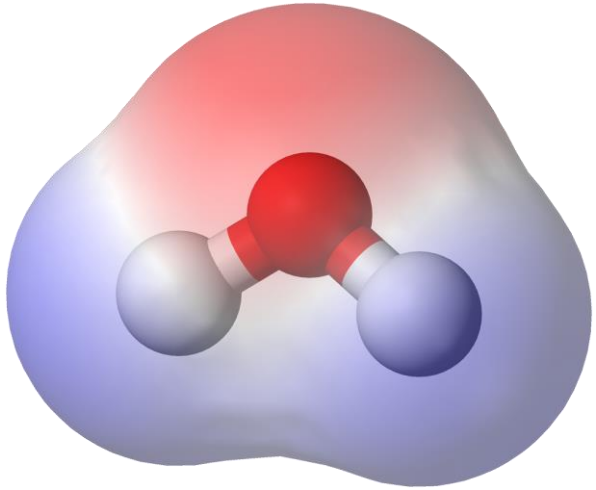


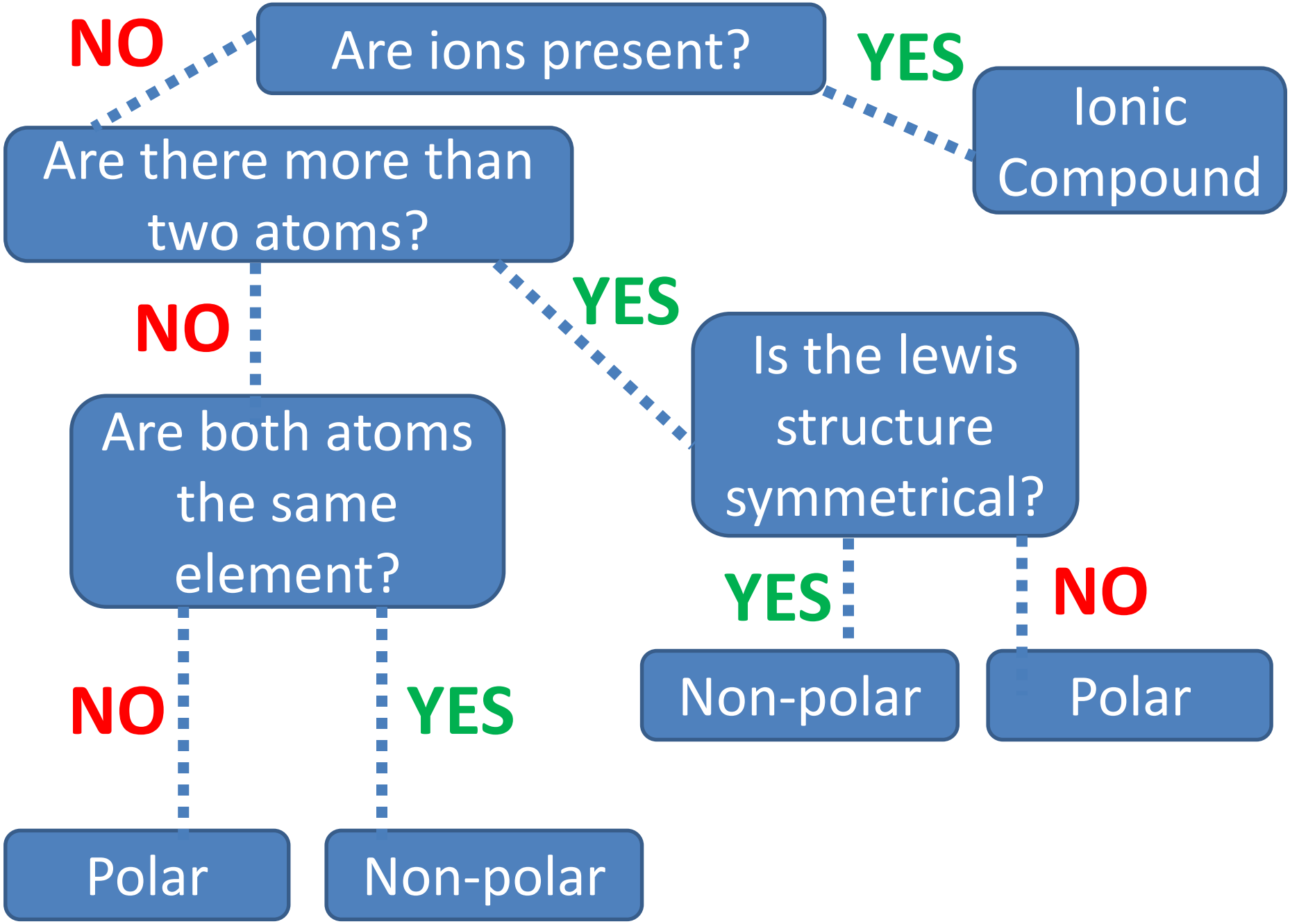


Three ways to diagram “dipoles”








NO
Are ions present?
YES
Ionic Compound
Are there more than two atoms?
NO
YES
Are both atoms the same element?
Is the lewis structure symmetrical?
NO
YES
YES
NO
Polar
Non-polar
Non-polar
Polar

Molecule	Lewis Structure	Polar or non polar?
H_2O		
Br_2		
CH_4		
NH_3		
CS_2		
CH_3Br		

Target: I can identify polarity of molecules

Polarity Flow Chart Handout

K	C	Q

YouTube Link to Presentation

- https://youtu.be/RqmDU2u3aNw