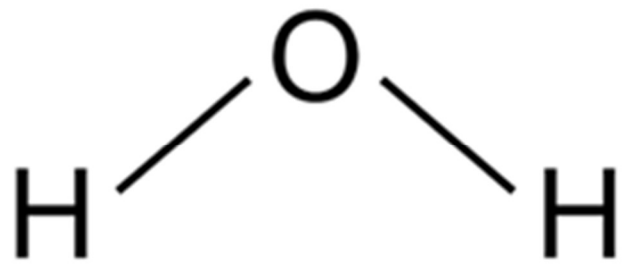
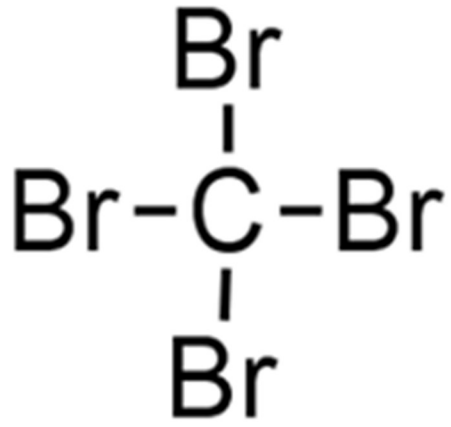
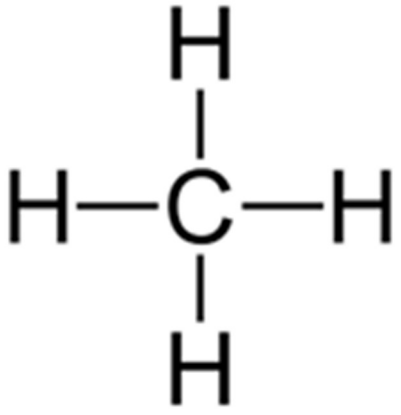
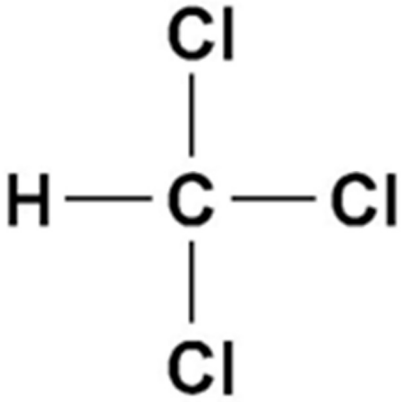
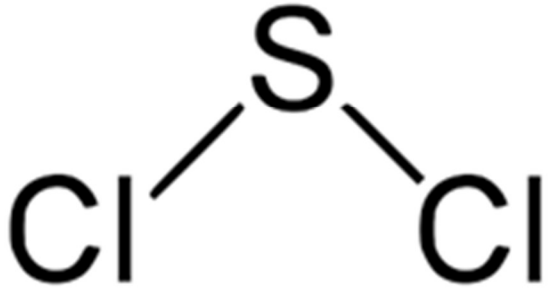
1 Which are polar MOLECULES? Which exhibit dipole attraction, which exhibit hydrogen bonding?











2 How many pairs of electrons are in each of the bonds here?

F_2 O_2 Cl_2

N_2 C_2H_2 (two here)

HCl NaCl

3 Name all of the bonds in these two compounds…

C_2H_2

CS_2

4 Name all of the bonds in these compounds…

KCl

$MgSO_4 \cdot 7H_2O$

5 The molecules formed in group 17 are all diatomic, all have single nonpolar covalent bonds, and are all nonpolar molecules; yet two are gases, one is liquid and one is a solid at STP.

Which are gases?
Which is a liquid?
Which is a solid?
What sort of bonding is going on here to explain this?

6 Draw the Lewis Dot Diagrams for

$CHBr_3$

CO_2

O_2

H_2O

7 Are these molecules polar or nonpolar?

$CHBr_3$

CO_2

O_2

H_2O

8 Name all the bonds in these.

$CHBr_3$

CO_2

O_2

H_2O

9 Name all the bonds in these.

KCl

SiO_2

SCl_2

BF_3

10 Rank the bonds
most polar to least polar…

HCl	HBr
HF	HI

11 Which of these makes only ionic bonds?

HCl	KCl
$MgCl_2$	NCl_3
SCl_2	NaCl

12 Which of these molecules has radial symmetry?

C_2H_4	H_2O
CO_2	CS_2
CCl_4	$CHCl_3$

BONUS

What are the relative oxidation numbers for all atoms/ions here?

$MgSO_4$	CH_4
H_2O	CS_2
CO_2	CO

BONUS #2

Name the special bonds that are found in these compounds….

Phosphorous Pentachloride
Ozone
Boron Trifluoride
Carbon Monoxide
Janet and Charlie

Something special happens with the bonding in each of these…

(What rules do they break?)

Walk around Practice for Bonding

1. Which are the polar molecules? _____

Which exhibit dipole attraction? _____

Which exhibit hydrogen bonding? _____

2. How many pairs of electrons are being shared in these molecules?

F_2 _____ O_2 _____ Cl_2 _____ N_2 _____

C_2H_2 _____ and _____ HCl ____ NaCl ____

3. Name all bonds in C_2H_2 _____

CS_2 _____

4. Name all bonds in KCl _____

$MgSO_4 \cdot 7H_2O$ _____ _____

5. Gases are _____ + _____ Liquid is _____ Solid is _____

This is caused by _____

6 Draw Lewis Dot Diagrams for $CHBr_3$	Draw Lewis Dot Diagrams for CO_2
Draw Lewis Dot Diagrams for O_2	Draw Lewis Dot Diagrams for H_2O

7. Polar molecules are _____ Nonpolar molecules are _____

8. Name all the bonds in… $CHBr_3$ has C-H _____

and C-Br _____

CO_2 _____

O_2 _____ H_2O _____

Name all of the bonds in.. KCl _____

SiO_2 _____ SCl_2 _____

BF_3 _____

10. Rank these bonds….	most polar → → →	
HCl HBr HF HI		
	least polar → → →	

11. Which of these have ONLY ionic bonds? _____

12. Which of these have radial symmetry? _____

BONUS: Relative oxidation numbers…		
B1	$MgSO_4$	Mg S O O O O
B2	CH_4	C H H H H
B3	H_2O	H H O
B4	CS_2	C S S
B5	CO_2	C O O
B6	CO	C O

BONUS #2

Name the special bonds that are found in these compounds…. (or, what rules do they break?)

Phosphorous Pentachloride

Ozone

Boron Trifluoride

Carbon Monoxide

Janet and Charlie

Walk around Practice for Bonding… answers are on Arbuiso.com

1. Which are the polar molecules? H_2O $CHCl_3$ SCl_2

Which exhibit dipole attraction? SCl_2

Which exhibit hydrogen bonding? H_2O $CHCl_3$

2. How many pairs of electrons are being shared in these molecules?

F_2 one O_2 two Cl_2 one N_2 three

C_2H_2 three and one HCl one NaCl none are shared in an ionic bond

3. Name all bonds in

C_2H_2 The C to C bond is triple nonpolar covalent, the C to H bond is single polar covalent

CS_2 The C to S bonds are both double NON polar covalent (same electronegativity, no guessing)

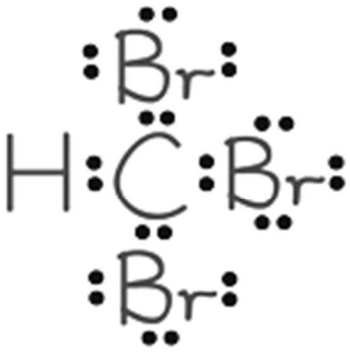
4. Name all bonds in KCl Just ionic

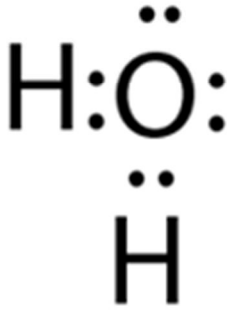
$MgSO_4 \cdot 7H_2O$ Here, Ionic, polar covalent, hydrogen bonds, and single polar covalent bonds too.

5. Gases are F_2 + Cl_2 Liquid is Br_2 Solid is I_2

This is caused by the intermolecular attraction known as electron dispersion attraction

Draw Lewis Dot Diagrams for $CHBr_3$ CO_2 O_2 H_2O





7. Polar molecules are $CHBr_3$ and H_2O Nonpolar molecules are CO_2 and O_2

Name all the bonds in… $CHBr_3$ has C-H single polar covalent and C-Br single polar covalent

CO_2 double polar covalent O_2 double nonpolar covalent H_2O two single polar covalent

Name all of the bonds in.. KCl ionic SiO_2 two double polar covalent
SCl_2 two double polar covalent BF_3 three single polar covalent

10. Rank these bonds…. most polar → → →		HF	Greatest difference in electronegativity
HCl HBr HF HI		HCl	
		HBr	
	least polar → → →	HI	Least difference in electronegativity

11. Which of these compounds have ONLY ionic bonds? KCl, $MgCl_2$ and NaCl

12. Which of these molecules have radial symmetry? C_2H_4 CO_2 CS_2 CCl_4

BONUS: Relative oxidation numbers…		
B1	$MgSO_4$	Mg^{+2} S^{+6} O^{-2} O^{-2} O^{-2} O^{-2}
B2	CH_4	C^{+4} H^{-1} H^{-1} H^{-1} H^{-1}
B3	H_2O	H^{+1} H^{+1} O^{-2}
B4	CS_2	C^{+4} S^{-2} S^{-2}
B5	CO_2	C^{+4} O^{-2} O^{-2}
B6	CO	C^{+2} O^{-2}

BONUS #2:
PCl_5 breaks the octet rule (too big)
O_3 Ozone breaks the octet rule with the resonating bond
BF_3 breaks the octet rule by not getting an octet
CO breaks the octet rule by having a double polar covalent bond & a coordinate covalent bond.
Janet and Charlie do not break any rules. They are bonded by IONIC LOVE.