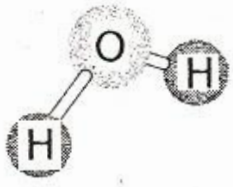
Aim: How do we calculate the formula mass of a compound?

Water	H_2O	

To get the formula mass **just add up all the masses** of the atoms that make up a unit of the substance.

H_2O

2 amu + 16 amu = 18 amu per molecule of water

amu = atomic mass unit

(By the way, 1amu=1.66 x 10^{-24} g. Therefore, 1 water molecule weighs 18 x 1.66 x 10^{-24} g.)

NH_3
14+3(1) = 17 amu

$KClO_4$
39 + 35 + 4(16) = 138 amu

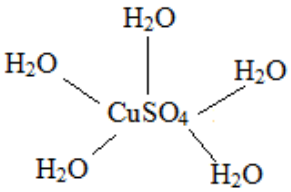
NaCl
23+ 35 = 58 amu

$Ba(NO_3)_2$ = BaN_2O_6
137 + 2(14) + 6(16) = 261 amu
1st distribute the subscript to get rid of the parentheses.

$CuSO_4 \cdot 5H_2O$ a "hydrate" – a salt with water attached to it

↓

Remember: when you see the dot, **add** don't multiply.



64 + 32 + 4(16) + 5(18) = 250 amu

Easy way to remember water: "The legal age for drinking water is 18."

Let's go to today's handout. Try problem#1.

Formula Mass

Determine the of each compound below.

1. $KMnO_4$

K Mn O_4
39 + 55 + 4(16) = 158 amu

2. KCl

K Cl
39 + 35 = 74 amu

EXTRA PROBLEMS

magnesium phosphate

Mg^{+2} PO_4^{-3} → $Mg_3(PO_4)_2 = Mg_3P_2O_8$

3(24) + 2(31) + 8(16) = 262 amu

Remember: 1st get rid of the parenthesis by distributing the subscript.

calcium nitrite

Ca^{+2} NO_2^{-1} → $Ca(NO_2)_2 = CaN_2O_4$

40 + 2(14) + 4(16) = 132amu

IF TIME PERMITS TO DO MORE,

barium acetate

Ba^{+2} $C_2H_3O_2^{-1}$ → $Ba(C_2H_3O_2)_2 = BaC_4H_6O_4$

137 + 4(12) + 6(1) + 4(16) = 255 amu

aluminum sulfate

Al^{+3} SO_4^{-2} → $Al_2(SO_4)_3 = Al_2S_3O_{12}$

2(27) + 3(32) + 12(16) = 342 amu

cobalt (III) chlorate

Co^{+3} ClO_3^{-1} → $Co(ClO_3)_3 = CoCl_3O_9$

59 + 3(35) + 9(16) = 308 amu

iron (II) sulfite

Fe^{+2} SO_3^{-2} → = $FeSO_3$

56 + 32 + 3(16) = 136 amu