PERCENTAGE COMPOSITION   **Name_____**

The formula mass of a substance is the sum of the atomic masses of all the atoms in the formula.

For example, the formula mass of sodium chloride, NaCl, is 58.44. It is the sum of the atomic mass of sodium, 22.99, and the atomic mass of chlorine, 35.45.

Na   22.99
Cl $+$ 35.45
     $= \overline{58.44}$

Another example, the formula mass of sodium sulfate, Na_2SO_4, is 142.04.

|		
Na	$22.99(2) = 45.98$	45.98
S	$32.06(1) = 32.06$	32.06
O	$16.00(4) = 64.00$	$+\underline{64.00}$
		$= 142.04$
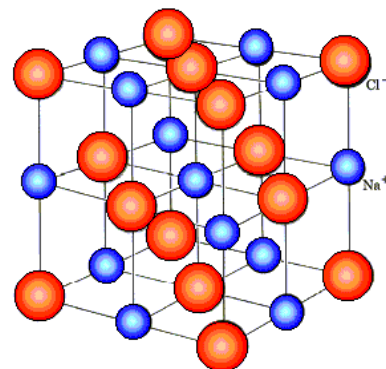
Percent **composition** can be determined with the mass ratios from the formula mass. To find percent composition, divide the mass of the atom(s) by the total mass of the compound, then multiply by 100 to find the percent.

For example, the percent composition of sodium is 39.34%
What % is sodium of the NaCl?

$$\frac{22.99}{58.44} \text{ x } 100 = 39.34\%$$

Another example: What % sulfur in Na_2SO_4?

$$\frac{32.06}{142.04} \text{ x } 100 = 22.57\%$$
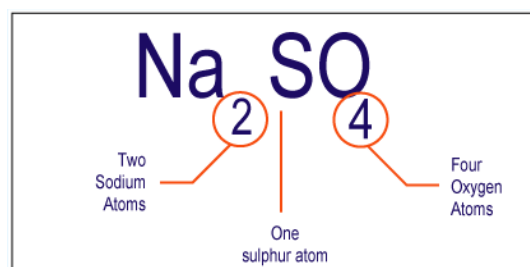
Final example: In Na_2SO_4, what percent is oxygen?

$$\frac{64.00}{142.04} \text{ x } 100 = 45.06\%$$

Steps...
1. **Write formulas CORRECTLY with subscripts (if needed)**
2. **Look up mass on Periodic Table (round to hundredths)**
3. **Add mass together to find total mass of compound.**
4. **Calculate % composition. Divide the mass of cation by the total mass of the compound (change the decimal to a percentage)**

Write formulas for the **following compounds**, then find the **percent composition** for the cation (metal) in each.

1. copper(II) oxide   2. iron(II) phosphate

3. mercury(I) chloride

4. calcium hydride

5. tin(IV) hydroxide

6. iron(III) sulfate

7. magnesium carbonate

8. ammonium dichromate

9. chromium(III) iodide

10. lithium nitrate

11. potassium sulfite

12. potassium phosphate

13. mercury(II) cyanide

14. nickel(II) chromate

15. ammonium cyanide

16. tin(II) chloride

17. sodium carbonate

18. aluminum nitrate

19. aluminum sulfide

20. copper(I) sulfide

21. chromium(III) hydroxide

22. lead(II) bromide

23. cobalt(II) nitrite

24. copper(II) carbonate