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<https://www.teacherspayteachers.com/Store/Mr-Cuvs-Chemistry-Class>

If you aren't interested in checking out my page – no worries! I hope this formula sheet is still helpful! I have it as a poster in my own classroom for honors chemistry.

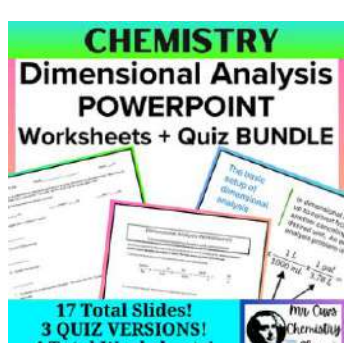
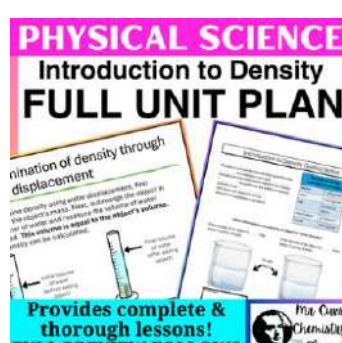
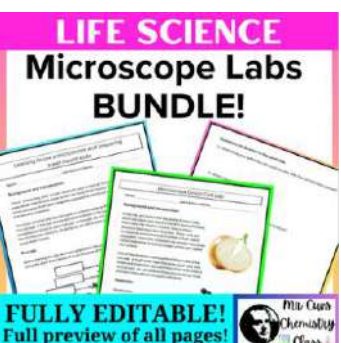
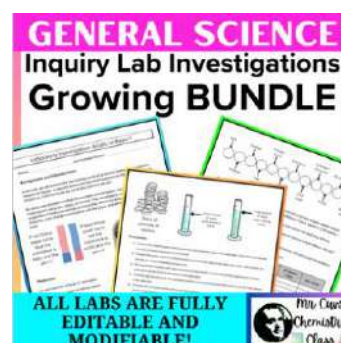
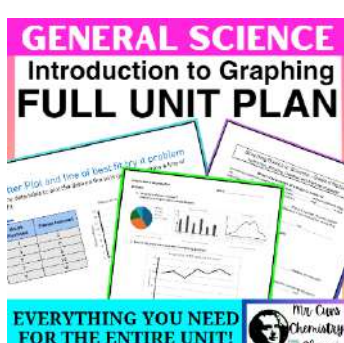
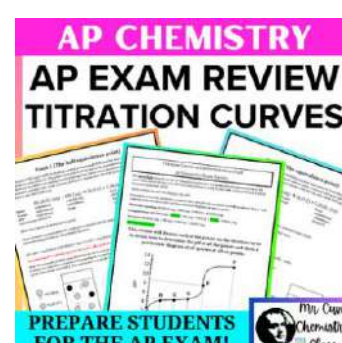
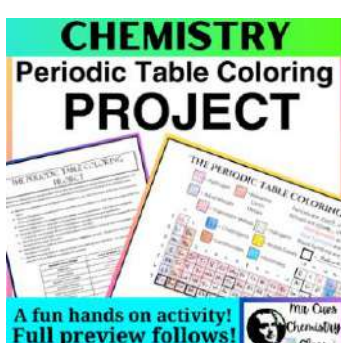
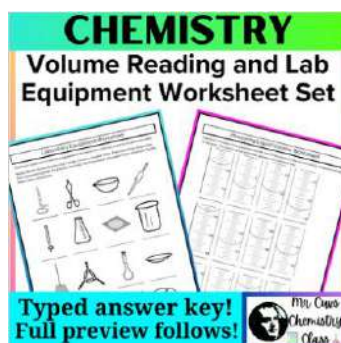
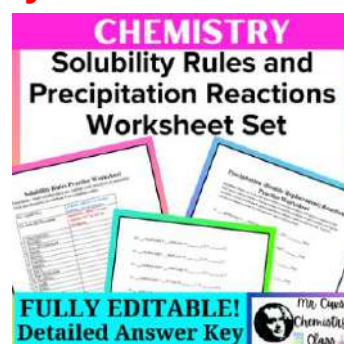
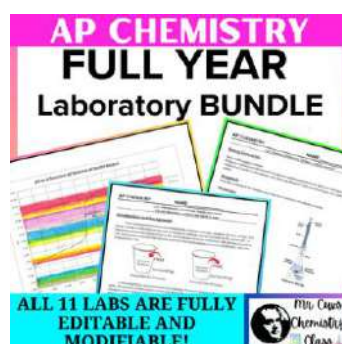
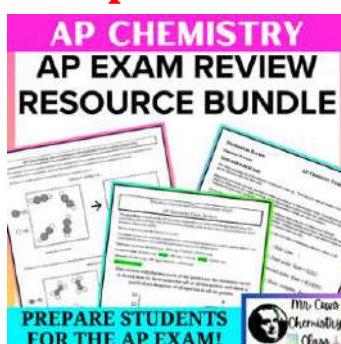
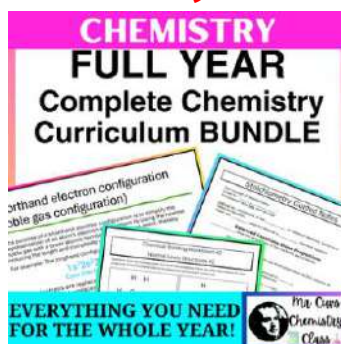
\*The enclosed document is **NOT** customizable. There is a fully editable version available here [Editable Formula Sheet](#). You can add or remove any formulas you would like to with Microsoft equation editor in WORD.

Thanks for your support and I welcome any feedback you may have.



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## CHEMISTRY EQUATIONS AND CONSTANTS

### LAB AND STOICHIOMETRY

$$\% \text{ Error} = \frac{|\text{measured value} - \text{accepted value}|}{\text{accepted value}} \times 100$$

| | = denotes absolute value in % error equation

$$\% \text{ composition by mass} = \frac{\text{mass of part}}{\text{mass of whole}} \times 100$$

$$\% \text{ yield} = \frac{\text{actual yield}}{\text{theoretical yield}} \times 100$$

$$n = \frac{m}{M}$$

### GASES AND LIQUIDS

$$PV = nRT$$

$$n = \frac{m}{M}$$

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$$P_{TOTAL} = P_A + P_B + P_C \dots$$

$$K = ^\circ\text{C} + 273$$

$$D = \frac{m}{V}$$

$$P_A = P_{TOTAL} \times X_A, \text{ where } X_A = \frac{\text{moles of A}}{\text{total moles}}$$

### SOLUTIONS

molarity,  $M$  = moles of solute per liter of solution

molality = moles of solute per kilogram solvent

$$\Delta T_f = iK_f \times \text{molality}$$

$$\Delta T_b = iK_b \times \text{molality}$$

$$\text{Dilution Formula: } M_1 V_1 = M_2 V_2$$

### SYMBOLS

$P$  = pressure

$V$  = volume

$n$  = number of moles

$T$  = Temperature

$M$  = molar mass

$D$  = density

$m$  = mass

$X_A$  = mole fraction

$M$  = molarity

$K_f$  = molal freezing-point depression constant

$K_b$  = molal boiling-point elevation constant

$i$  = van't Hoff factor

### CONSTANTS

$$\text{Gas Constant, } R = 0.0821 \frac{\text{L atm}}{\text{mol K}}$$

$$= 62.4 \frac{\text{L torr}}{\text{mol K}}$$

$$K_f \text{ for H}_2\text{O} = 1.86 \frac{^\circ\text{C kg}}{\text{mol}}$$

$$K_b \text{ for H}_2\text{O} = 0.512 \frac{^\circ\text{C kg}}{\text{mol}}$$

$$1 \text{ atm} = 760 \text{ mmHg} = 760 \text{ torr} = 101.3 \text{ kPa}$$

$$\text{STP} = 0.00 ^\circ\text{C and } 1.00 \text{ atm}$$

$$\text{Avogadro's number} = 6.02 \times 10^{23} \frac{\text{molecules}}{\text{mol}}$$



## ATOMIC STRUCTURE

$$E = h\nu$$

$$c = \lambda\nu$$

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## THERMODYNAMICS

$$\Delta G_{rxn} = \sum \Delta G_f^\circ \text{ products} - \sum \Delta G_f^\circ \text{ reactants}$$

$$\Delta H_{rxn} = \sum \Delta H_f^\circ \text{ products} - \sum \Delta H_f^\circ \text{ reactants}$$

$$\Delta S_{rxn} = \sum S^\circ \text{ products} - \sum S^\circ \text{ reactants}$$

$$\Delta G^\circ = \Delta H^\circ - T\Delta S^\circ$$

$$\Delta G^\circ = -n_e FE^\circ$$

$$q = mc\Delta T \text{ where } q_p = \Delta H$$

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## ACIDS AND BASES

$$pH = -\log [H^+]$$

$$pOH = -\log [OH^-]$$

$$14 = pH + pOH$$

$$[H^+] = 10^{-pH}$$

$$[OH^-] = 10^{-pOH}$$

$$[OH^-] \times [H^+] = 1.0 \times 10^{-14} \text{ @ } 25^\circ\text{C}$$

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## NUCLEAR CHEMISTRY

$$\# \text{ of half lifes} = \frac{\text{Total Time Elapsed}}{\text{Half Life Time}}$$

$$\text{Fraction Remaining} = \left(\frac{1}{2}\right)^{\# \text{ of half lifes}}$$

$$\text{Sample Remaining} = \text{Original Sample} \times \text{Fraction Remaining}$$

## SYMBOLS AND CONSTANTS

$E$  = energy

$\nu$  = frequency

$\lambda$  = wavelength in meters

$m$  = mass

Speed of light,  $c = 3.0 \times 10^8 \frac{\text{meters}}{\text{second}}$

Planck's constant,  $h = 6.63 \times 10^{-34} \text{ J s}$

Faraday's constant,  $F = 96,500 \frac{\text{coulombs}}{\text{mole of electrons}}$

## SYMBOLS

$\Delta H^\circ$  = standard enthalpy

$\Delta G^\circ$  = standard free energy

$\Delta S^\circ$  = standard entropy

$T$  = temperature

$n_e$  = number of moles of electrons

$q$  = heat

$m$  = mass

$c$  = specific heat capacity

