Short version

1. Elements = 0
2. Monoatomic ion = O
3. F: -1
4. O: -2 (unless peroxide -1)
5. H: +1 (unless metal hydroxide = -1)
6. Sum of oxid. #s = overall charge (0 in compounds)

c) Hydrogen (H) has oxid # +1, except in compounds w/ alkali ~~metals~~ or alkali earth metals

d) Fluorine has oxid # -1

e) Oxygen has oxid # -2, unless w/ F

f) Other halogens have (-1) except w/ F or O

ex: SO_4^{2-} $\quad +6+(-2)4=-2$ $\qquad$ NH_4^+ $\quad -3+(+1)4=+1$ $\qquad$ MnO_4^- $\quad 7+(-2)4=-1$

$$\overset{0}{I_2}(s) + \overset{-2\ +1}{OCl^-}(aq) \rightarrow \overset{+5\ (-2)3}{IO_3^-}(aq) + \overset{-1}{Cl^-}(aq)$$

oxidized: $I_2 \rightarrow IO_3^-$ $\quad$ reduced: $OCl^- \rightarrow Cl^-$

Lose
Electrons
Oxidation
says
Gain
Electrons
Reduced

"Nitric Acid acts upon copper" Ira Remsen

- Chem prof @ Williams College, 1872–1876
- Accidentally rediscovered saccharin in 1878
- President of Johns Hopkins University (1901–1912)

$$2HNO_3(aq) + Cu(s) \rightarrow Cu^{2+}(aq) + 2NO_2(g) + 2H_2O(l)$$

$$\overset{0}{Zn}(s) + 2\overset{+1}{H^+} \rightarrow \overset{+2}{Zn^{2+}} + \overset{0}{H_2}(g)$$

Half Reactions

Ox: $Zn(s) \rightarrow Zn^{2+} + 2e^-$ $\quad$ e⁻ # equal

Red: $2e^- + 2H^+ \rightarrow H_2(g)$

Balancing Redox Rxns

1) Make 2 half-rxns
2) Balance atoms other than O and H, then balance O and H w/ H_2O/H^+
3) Add e^- to balance charge
4) Multiply by common factor to make e^- in ½ rxn =
5) Add ½ rxns
6) Simplify by dividing by common factor or converting H^+ to OH^- if basic
7) Double-check atoms and charges balance!