Worksheet (Assigning Oxidation Numbers)

Use the *Rules for Assigning Oxidation Numbers* to determine the oxidation number assigned to each element in each of the given chemical formulas:

Formula	Element and oxidation number		Formula	Element and oxidation number	
CaF_2	Ca:	F:	NCl_3	N:	Cl:
CO	C:	O:	Cl^-	Cl:	
CO_3^{2-}	C:	O:	Mg^{2+}	Mg	
NaH	Na:	H:	Na_2O_2	Na:	O:
OF_2	O:	F:	$Cr_2O_7^{2-}$	Cr:	O:
H_2O_2	H:	O:			
$BrCl_3$	Br:	Cl:			
NH_3	N:	H:			

Rules for Assigning Oxidation Numbers

1. The oxidation number of any uncombined element is 0.
2. The oxidation number of a monatomic ion equals the charge on the ion.
3. The more-electronegative element in a binary compound is assigned the number equal to the charge it would have if it were an ion.
4. The oxidation number of fluorine in a compound is always -1.
5. Oxygen has an oxidation number of -2 unless it is combined with F (when it is +2), or it is in a peroxide (such as H_2O_2 or Na_2O_2), when it is -1.
6. The oxidation state of hydrogen in most of its compounds is +1 unless it is combined with a metal, in which case it is -1.
7. In compounds, the elements of groups 1 and 2 as well as aluminum have oxidation numbers of +1, +2, and +3 respectively.
8. The sum of the oxidation numbers of all atoms in a neutrals compound is 0.
9. The sum of the oxidation numbers of all atoms in a polyatomic ion equals the charge of the ion.

Name	Formula
Iron(II)/Ferrous	Fe^{2+}
Iron(III)/Ferric	Fe^{3+}
Copper(I)/Cuprous	Cu^{+}
Copper(II)/Cupric	Cu^{2+}
Tin (II)/Stannous	Sn^{2+}
Tin (IV)/Stannic	Sn^{4+}
Lead (II)/Plumbous (most common)	Pb^{2+}
Lead (IV)/Plumbic	Pb^{4+}
Mercury (I) (Note: Mercury (I) is a polyatomic ion)	Hg_2^{2+}
Mercury (II)	Hg^{2+}