Oxidation Numbers Worksheet

Directions: 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					
1.	Cl_2	Cl					
2.	Cl^-	Cl					
3.	Na	Na					
4.	Na^+	Na					
5.	O_2	O					
6.	N_2	N					
7.	Al^{+3}	Al					
8.	H_2O	H		O			
9.	NO_3^-	N		O			
10.	NO_2	N		O			
11.	$Cr_2O_7^{2-}$	Cr		O			
12.	KCl	K		Cl			
13.	NH_3	N		H			
14.	CaH_2	Ca		H			
15.	SO_4^{2-}	S		O			

	Formula	Element and Oxidation Number					
16.	Na_2O_2	Na		O			
17.	SiO_2	Si		O			
18.	$CaCl_2$	Ca		Cl			
19.	PO_4^{3-}	P		O			
20.	MnO_2	Mn		O			
21.	FeO	Fe		O			
22.	Fe_2O_3	Fe		O			
23.	H_2O_2	H		O			
24.	CaO	Ca		O			
25.	H_2S	H		S			
26.	H_2SO_4	H		S		O	
27.	NH_4Cl	N		H		Cl	
28.	K_3PO_4	K		P		O	
29.	HNO_3	H		N		O	
30.	KNO_2	K		N		O	

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.

Answer Key									
1.	Cl:0	7.	Al:3+	13.	N:3- H:1+	19.	P:5+ O:2-	25.	H:1+ S:2-
2.	Cl:1-	8.	H:1+ O:2-	14.	Ca:2+ H:1-	20.	Mn:4+ O:2-	26.	H:1+ S:6+ O:2-
3.	Na:0	9.	N:5+ O:2-	15.	S:6+ O:2-	21.	Fe:2+ O:2-	27.	N:3- H:1+ Cl:1-
4.	Na:1+	10.	N:4+ O:2-	16.	Na:1+ O:1-	22.	Fe:3+ O:2-	28.	K:1+ P:5+ O:2-
5.	O:0	11.	Cr:6+ O:2-	17.	Si:4+ O:2-	23.	H:1+ O:1-	29.	H:1+ N:5+ O:2-
6.	N:0	12.	K:1+ Cl:1-	18.	Ca:2+ Cl:1-	24.	Ca:2+ O:2-	30.	K:1+ N:3+ O:2-