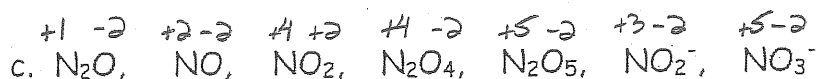
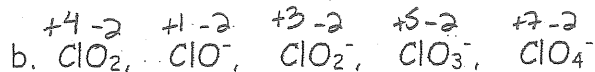
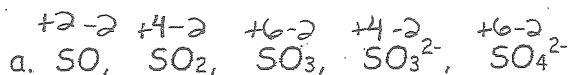
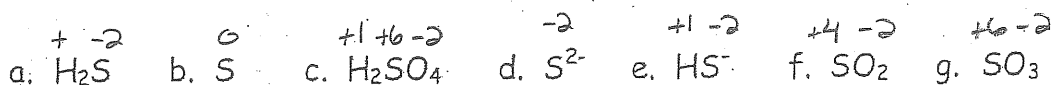


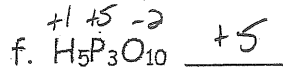
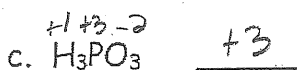
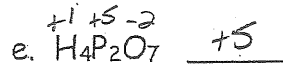
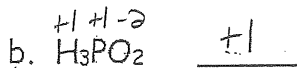
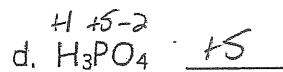
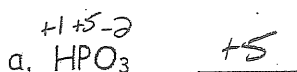
1. Give the oxidation numbers of all the elements in the following molecules and ions:



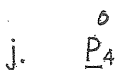
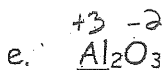
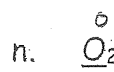
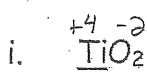
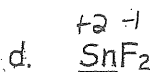
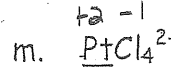
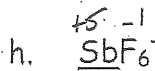
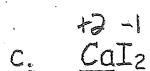
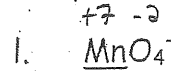
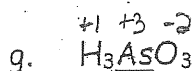
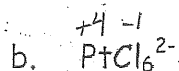
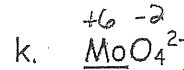
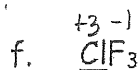
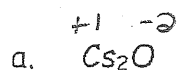
2. Determine the oxidation number of the sulfur atom:



3. Indicate the oxidation number of phosphorus in each of the following compounds:



4. Give oxidation numbers for the underlined atoms in these molecules and ions:



# 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 <sub>2</sub>	Cl	0		
2	Cl <sup>-</sup>	Cl	-1		
3	Na	Na	0		
4	Na <sup>+</sup>	Na	+1		
5	O <sub>2</sub>	O	0		
6	N <sub>2</sub>	N	0		
7	Al <sup>+3</sup>	Al	+3		
8	H <sub>2</sub> O	H	+1	O	-2
9	NO <sub>3</sub> <sup>-</sup>	N	+5	O	-2
10	NO <sub>2</sub>	N	+4	O	-2
11	Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>	Cr	+6	O	-2
12	KCl	K	+1	Cl	-1
13	NH <sub>3</sub>	N	-3	H	+1
14	CaH <sub>2</sub>	Ca	+2	H	-1
15	SO <sub>4</sub> <sup>2-</sup>	S	+6	O	-2

	Formula	Element and Oxidation Number					
16	Na <sub>2</sub> O <sub>2</sub>	Na	+1	O	-1		
17	SiO <sub>2</sub>	Si	+4	O	-2		
18	CaCl <sub>2</sub>	Ca	+2	Cl	-1		
19	PO <sub>4</sub> <sup>3-</sup>	P	+5	O	-2		
20	MnO <sub>2</sub>	Mn	+4	O	-2		
21	FeO	Fe	+2	O	-2		
22	Fe <sub>2</sub> O <sub>3</sub>	Fe	+3	O	-2		
23	H <sub>2</sub> O <sub>2</sub>	H	+1	O	-1		
24	CaO	Ca	+2	O	-2		
25	H <sub>2</sub> S	H	+1	S	-2		
26	H <sub>2</sub> SO <sub>4</sub>	H	+1	S	+6	O	-2
27	NH <sub>4</sub> Cl	N	-3	H	+1	Cl	-1
28	K <sub>3</sub> PO <sub>4</sub>	K	+1	P	+5	O	-2
29	HNO <sub>3</sub>	H	+1	N	+5	O	-2
30	KNO <sub>3</sub>	K	+1	N	+5	O	-2

## 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<sub>2</sub>O<sub>2</sub> or Na<sub>2</sub>O<sub>2</sub>), 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 neutral compound is 0.
9. The sum of the oxidation numbers of all atoms in a polyatomic ion equals the charge of the ion.

Calcium Hydroxide  
 → more EP gets - charge

#16  
 #23