

Name: \_\_\_\_\_

# 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.

Rules for Assigning Oxidation Numbers	Example:
1. The oxidation number of any uncombined element is <b>0</b> .	Ne, O <sub>2</sub> ▷ <b>0</b>
2. The oxidation number of a monatomic ion equals the charge on the ion.	Fe <sup>+3</sup> ▷ <b>+3</b>
3. The oxidation number of halogens in a compound is mostly <b>-1</b> .	F <sup>-1</sup> ▷ <b>-1</b>
4. Oxygen has an oxidation number of <b>-2</b> unless it's a peroxide is <b>-1</b>	H <sub>2</sub> O <sup>-2</sup> ▷ <b>-2</b> Na <sub>2</sub> O <sub>2</sub> <sup>+2</sup> ▷ <b>-1</b>
5. The oxidation number of a metal is <b>+1</b> in Group 1 and <b>+2</b> in Group 2.	K <sup>+1</sup> ▷ <b>+1</b>
6. Hydrogen works with <b>+1</b> with nonmetals and <b>-1</b> with metals.	H <sup>+1</sup> Cl <sup>-1</sup> ▷ <b>+1</b> Na <sup>+1</sup> H <sup>-1</sup> ▷ <b>-1</b>
7. The sum of the oxidation numbers of all atoms in a neutral compound is 0.	
8. The sum of the oxidation numbers of all atoms in a polyatomic ion = the charge of the ion.	

## 1. Give oxidation numbers for the underlined atoms in these molecules:

- |  |     |     |                          |  |     |    |
|--|-----|-----|--------------------------|--|-----|----|
| a. <u>Cs</u> <sub>2</sub> O                                    | Cs: | O:  | i. <u>N</u> <sub>2</sub> | N:   |     |    |
| b. <u>N</u> <sub>2</sub> O <sub>3</sub>                        | N:  | O:  | j. <u>Kr</u>             | Kr:  |     |    |
| c. <u>Na</u> <sub>4</sub> <u>Si</u> O <sub>4</sub>             | Na: | Si: | O:                       | k. <u>H</u> <sub>2</sub> O                       | H:  | O: |
| d. <u>K</u> <sub>2</sub> <u>Cr</u> <sub>2</sub> O <sub>7</sub> | K:  | Cr: | O:                       | l. <u>Fe</u> O                                   | Fe: | O: |
| e. <u>H</u> <sub>2</sub> <u>O</u> <sub>2</sub>                 | H:  | O:  | (This is a peroxide)     | m. <u>Ca</u> S                                   | Ca: | S: |
| f. <u>Al</u> (OH) <sub>3</sub>                                 | Al: | O   | H:                       | n. <u>H</u> <sub>2</sub>                         | H:  |    |
| g. <u>H</u> PO <sub>3</sub>                                    | H:  | P:  | O:                       | o. <u>He</u>                                     | He: |    |
| h. <u>H</u> <sub>2</sub> <u>Se</u> O <sub>3</sub>              | H:  | Se: | O:                       | p. <u>H</u> <sub>2</sub> <u>S</u> O <sub>4</sub> | S:  | H: |

## 2. Give the oxidation numbers for the following ions

- |  |     |                            |   |                            |     |
|--|-----|----------------------------|---|----------------------------|-----|
| a. <u>Cu</u> <sup>+1</sup>               | Cu: | b. <u>Co</u> <sup>2+</sup> | Co:                                       | c. <u>Cl</u> <sup>-1</sup> | Cl: |
| d. <u>I</u> O <sub>2</sub> <sup>-1</sup> | I:  | O:                         | e. <u>Sb</u> F <sub>6</sub> <sup>-1</sup> | Sb:                        | F:  |
|  |     |                            | f. <u>OH</u> <sup>-1</sup>                | O:                         | H:  |