Chemistry Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Mrs. Pavlovich Mon/Thurs Period\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Scientific Notation**

Scientists very often deal with very small and/or very large numbers. This can be confusing because of the large number of zeroes. Scientists prefer to express very large or very small numbers as powers of 10.

Write scientific notation in the form M x 10n where M is a number between 1 and 10 and n represents the number of decimal places to be moved. Negative n indicates a number that is less than 1.

When you convert between scientific and standard notation the number of significant figures cannot change. Write zeroes as needed to preserve the correct precision of the number.

Complete the chart by converting between standard and scientific notation. Keep the number of significant figures the same:

|  |  |  |  |
| --- | --- | --- | --- |
| problem # | Standard notation | Scientific notation | Number of significant figures |
| 1 | 1,230,000 |  |  |
| 2 | 56,000,000,000 |  |  |
| 3 | 12,050,000,000,000 |  |  |
| 4 |  | 1.206 x 105 |  |
| 5 |  | 4.700 x 106 |  |
| 6 |  | 6.0 x 109 |  |
| problem # | standard notation | scientific notation | significant figures |
| 7 | 0.00000265 |  |  |
| 8 | 0.00000000080200 |  |  |
| 9 | 0.0006040 |  |  |
| 10 | 0.0000000000215 |  |  |
| 11 |  | 1.246 x 10-5 |  |
| 12 |  | 2.500 x 10-8 |  |
| 13 |  | 6.007 x 10-12 |  |

Calculations with scientific notation can easily be accomplished by using the EE button on your calculator. Convert the following quantities using Avogadro’s number and the EE button.

1. How many molecules in 2.5 moles of carbon dioxide?
2. How many atoms in 2.5 moles of carbon dioxide?
3. How many moles is 5.87 x 1027 molecules of hydrogen?
4. How many moles is 5.009 x 1021 atoms of neon?