**SI System and Measurement**

Observations: Qaulitiative vs. Quantitative

SI System: what is it?

Advantages:

Base units (define):

Examples:

Derived Units (define):

Examples

Metric Prefixes

|  |  |  |  |
| --- | --- | --- | --- |
| **Prefix** | **Factor of 10** | **standard** | **written** |
| Micro, µ | 10-6 | .000,001 | Millionth |
| Milli, m | 10-3 |  | Thousandth |
|  | 10-2 | .01 | Hundreth |
| deci, d |  | .1 | Tenth |
| Kilo | 103 |  | Thousand |
| Mega |  | 1,000,000 | Million |
|  | 109 | 1,000,000,000 | Billion |

* + How to read this chart: EXAMPLE: 1 milligram (mg) = 10-3 g = .001 g = 1 thousandth of a gram

Scientific Notation:

Practice: Convert to scientific or standard notation as appropriate:

1. 5,300 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. 0.002,2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. 4,730,000 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 4. 0.000,992 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. 4.3 x 105 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 6. 6.2 x 10-3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. 1.79 x 107 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 8. 3.0 x 10-6 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Multiplying and dividing in scientific notation

1. (3 x 103)(2 x 102) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. (6 x 105) / (3 x 102) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. (4 x 102) x (1 x 10-4) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. (8 x 10-6) / (2 x 10-3) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Converting Units using conversion factors

Multiply the starting quantity by a conversion factor that has a value of 1.

The denominator of the factor is the unit converted from, the numerator is the unit converted to

Example: 2 feet is how many inches?

SI conversion factors

Example 15 s is how many ms?

Practice. Convert:

1. 13 km to m:

2. 130 µm to m:

3. 18 mg to g

4. 1.2 Mj to j

5. 9.2 Gb to b

\*\*6. 1.2 km to cm

\*\*7. 8 Mg to mg

\*\*\*8. 2.4 x 103 kg to mg