

The 5 Fundamental Quantities of SCIENCE

- The Universe is made up of matter & energy.
Matter is the scientific name for “stuff.”
- Matter is always made of atoms.
- Mass is the (quantity of matter).
- Weight and mass are very different features of matter (weight depends on gravity, mass does not). (Weight measures force.)
- To study matter scientists measure **5** kinds of Quantities.

The Fundamental Quantities for matter are:
Time, Temperature, Distance, Volume, Mass.

- Everything else in science is derived (which means to get by reasoning or formulas).
- Units are critical in measurement. **ALWAYS USE UNITS, ALWAYS!**
(A mass of 500 or a velocity of 65 means nothing without the units.)(*Mars Climate Orbiter – 1999*)
- The metric system is based on multiples of 10 and is logical for 4 of the fundamental Quantities. (Which 1 is it not?)
- Time. Time is based on earth’s journey through space. Time is relative (we will wait to explore that)
- Time is measured in seconds (sec.) (60 sec. in a minute, 60 min. in an hour)
- The metric standard for distance is the meter
- The metric standard for volume is the liter.
- The metric standard for mass is the gram.
- The metric standard for temperature is degree Celsius (°C).
- **Temperature** is just a measure of how fast molecules are moving. (*Sample Temps*)

Metric Prefixes You Should Know:

Kilo = 1000, Base Unit = 1, Centi = 1/100, Milli = 1/1000

(What do they call a ¼ pounder w/ cheese in France?)

Density Matters:

Volume is a measurement of the amount of space matter takes up. (Measured in liter or cm³)

Density is a measurement of how tightly packed molecules are packed together.

DENSITY = MASS/VOLUME
DENSITY = A BROKEN **HEART**

