

Key Concepts for the Lecture of 23Jun03

- Physics deals with interaction of matter in space and time.
- Three basic "dimensions" [M] [L] [T]
 - [M] --> mass, a property of matter
 - [L] --> length, a property of space
 - [T] --> time, which allows change or evolution
- All measurement is comparison to a standard.
- Units correspond to dimensions and represent the particular standard chosen. We use SI units, the so-called "MKS" (meter-kilogram-second) system.
- A units conversion factor has value 1. Multiplying by a conversion factor does not change the value of a quantity, it only changes the units in which it is expressed.
EG: 2.54 cm = 1 in, so multiplying a length in inches by 2.54 cm/in converts inches to cm.
- All measurement has uncertainty. Sources are ambiguity in the thing being measured, calibration errors in the instrument (accuracy), and resolution of the instrument (precision).
- Accuracy reflects how close a measurement is to the actual value of the property being measured.
- Precision is how much information about a measurement is displayed.
- Scientific notation is in the form

$$a.bcd \times 10^n$$

The number of "significant figures" is the number of digits in the numeric expression. The "order of magnitude" is the exponent of 10.

- Use only the number of significant figures warranted by the accuracy of the measurement. Avoid "misplaced precision."