

# Measurements

Measurements are comparisons of properties against accepted standards, called units.

## ENGLISH / US SYSTEM OF UNITS:

$$1 \text{ foot} = \underline{12} \text{ inches}$$

$$1 \text{ yard} = \underline{3} \text{ feet}$$

$$1 \text{ mile} = \underline{1760} \text{ yards}$$

$$\underline{5280} \text{ feet} = 1 \text{ mile}$$

So what's the problem?

The English system of units is an inconsistent mess. Units don't relate to one another in meaningful ways.

PLUS - each kind of unit has a completely different set of relationships to memorize.

English units are nonstandard and difficult to use. Solution?

## THE METRIC SYSTEM

All metric units are made up of COMBINATIONS of BASE UNITS!

Metric Base Units:

Length	meter	m
Mass	*kilogram	kg
Temperature	Kelvin	K
Time	second	s

\*we usually treat the gram as if it's the base unit for mass!

- One meter is approximately 3.3 feet.
- One kilogram is approximately 2.2 pounds.

What about SIZE?

Metric units may be made larger or smaller by adding PREFIXES.

A few common metric prefixes:

mega-	$10^6$	M
kilo-	$10^3$	k
centi-	$10^{-2}$	c
milli-	$10^{-3}$	m
micro-	$10^{-6}$	$\mu$

Bigger units

smaller units

MEMORIZE the common metric prefixes listed in the study guide

Applying prefixes

$$1 \text{ m} = \text{m}$$

$$1 \text{ km} = 10^3 \text{ m} \quad (1000 \text{ m})$$

$$1 \text{ cm} = 10^{-2} \text{ m} \quad \left( \frac{1}{100} \text{ m} \right)$$