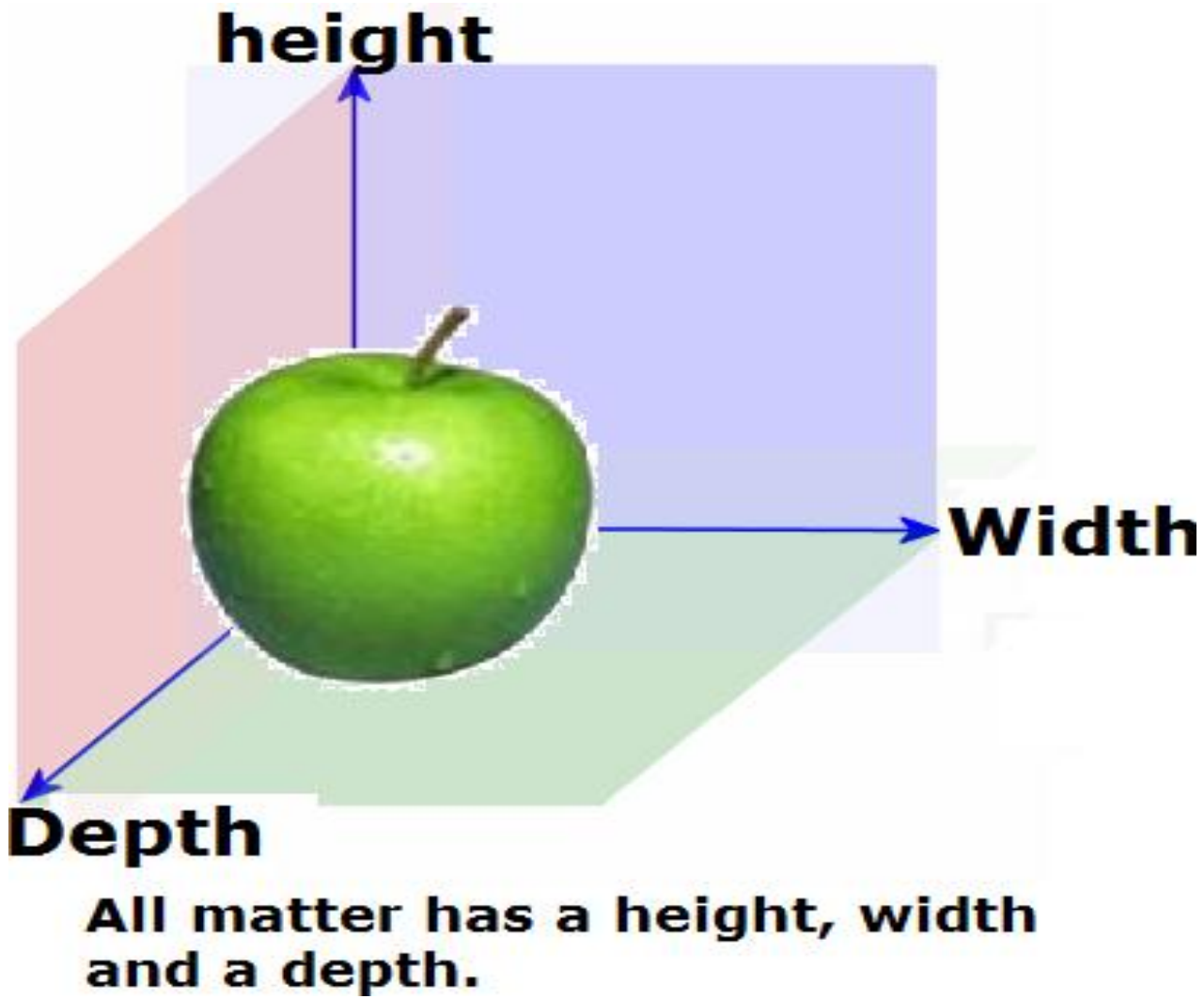
Types of quantities

- There are 2 categories of Measurable quantities to which all other things belong. They may be either, **fundamental quantities** which may not be broken down to anything simpler such as length or time, or it maybe a **derived quantity**; one which is composed of 2 or more fundamental(simpler) quantities, such as miles-per-hour which is composed of 2 fundamental quantities: length(miles) and time(1 hour).

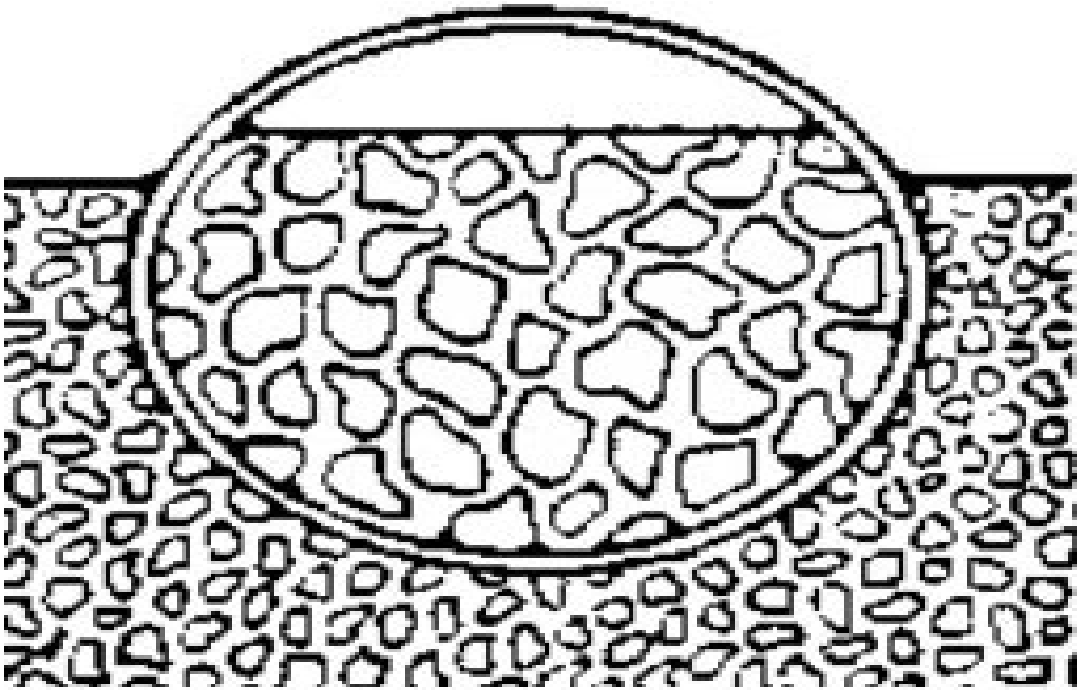
The 5 Classical Fundamental Quantities:

1. Length:



1. Length: Length refers to Measurable dimensions such as height, width or Length. Symbol is /

2. Mass:



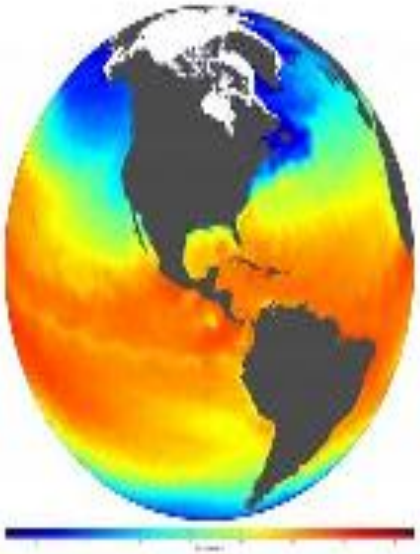
The amounf of matter in a material is its' Mass.

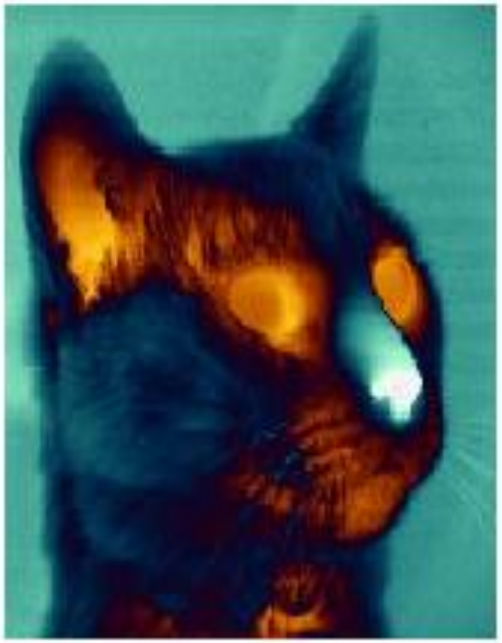
2. Mass: The amount of a substance that an object contains, anything which exists has mass(please note this is different to it's weight which is the force produced under the pull of gravity, something on the moon has 1/3 the weight of something on earth but it's mass remains the same.) Symbol is *m*

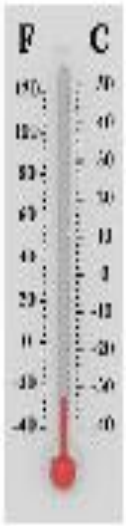
3. Time:

3. Time: measure of duration or sequence of events.
Symbol is *t*

4.Temperature:

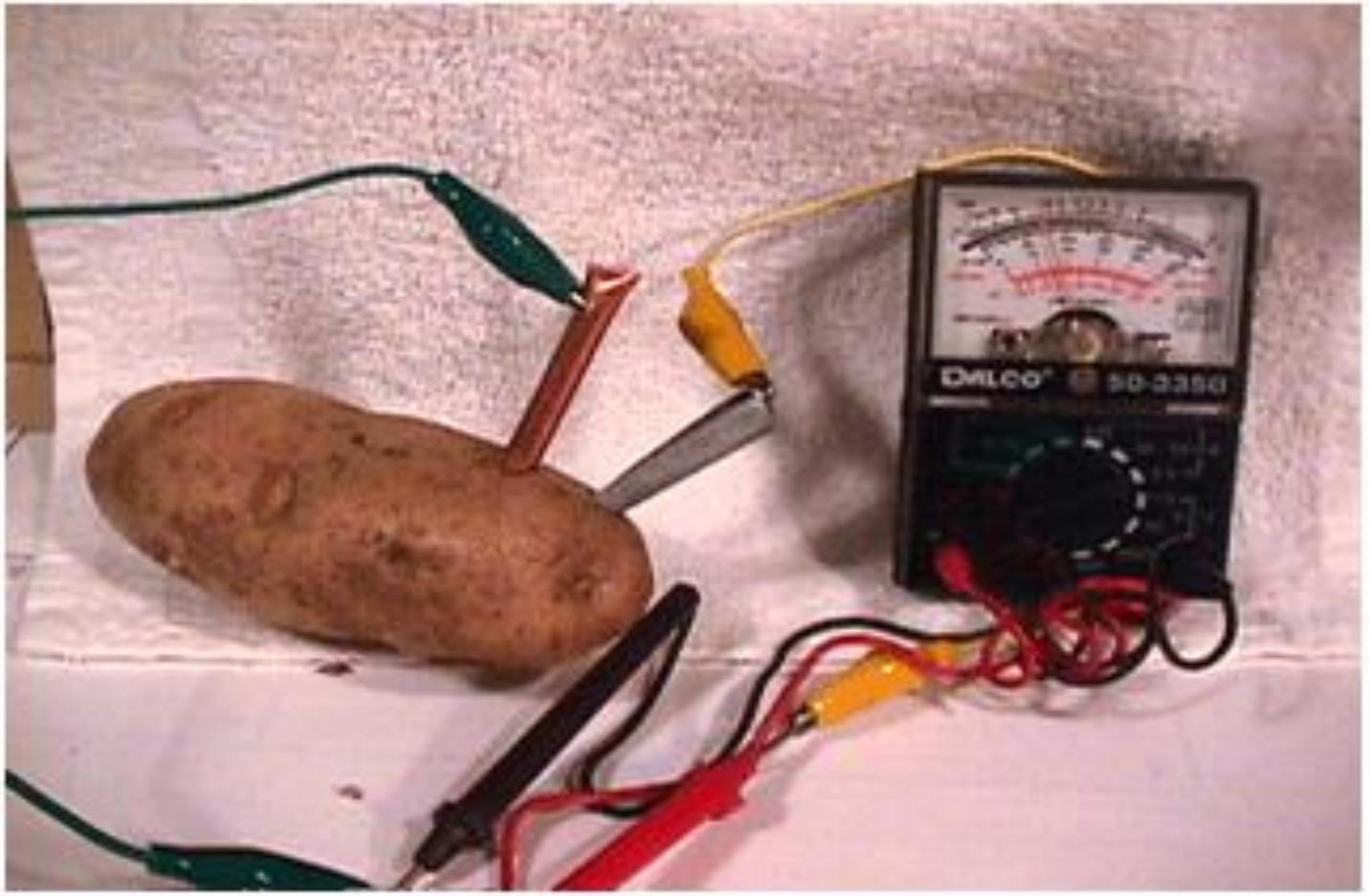






4. Temperature: This is a measure of the kinetic energy of the particles of a substance, e.g the particles of a very hot object will be moving very rapidly and will have a high temperature, those of a cold object will move slowly and have a low temperature. Symbol is *T*

5. Electric current:



5. Electric current: Quantity of electrical charge an object contains, all matter has a certain amount of electrical charge. Symbol is *Q*

2 More fundamental quantities

- 6. Luminous intensity: measure of the intensity of light emitted.
- 7. Amount of substance: Refers to the specific number of atoms an object contains.

Base quantities and their units:

Base Quantities		Units	
Length	l	Metre	M
Mass	m	Kilogram	kg
Time	t	Second	S
Temperature	T		
Celsius	${}^{0}C$	Celsius	${}^{0}C$
Kelvin		Kelvin	K
Electric Current	I	Ampere	A

Derived Quantities:

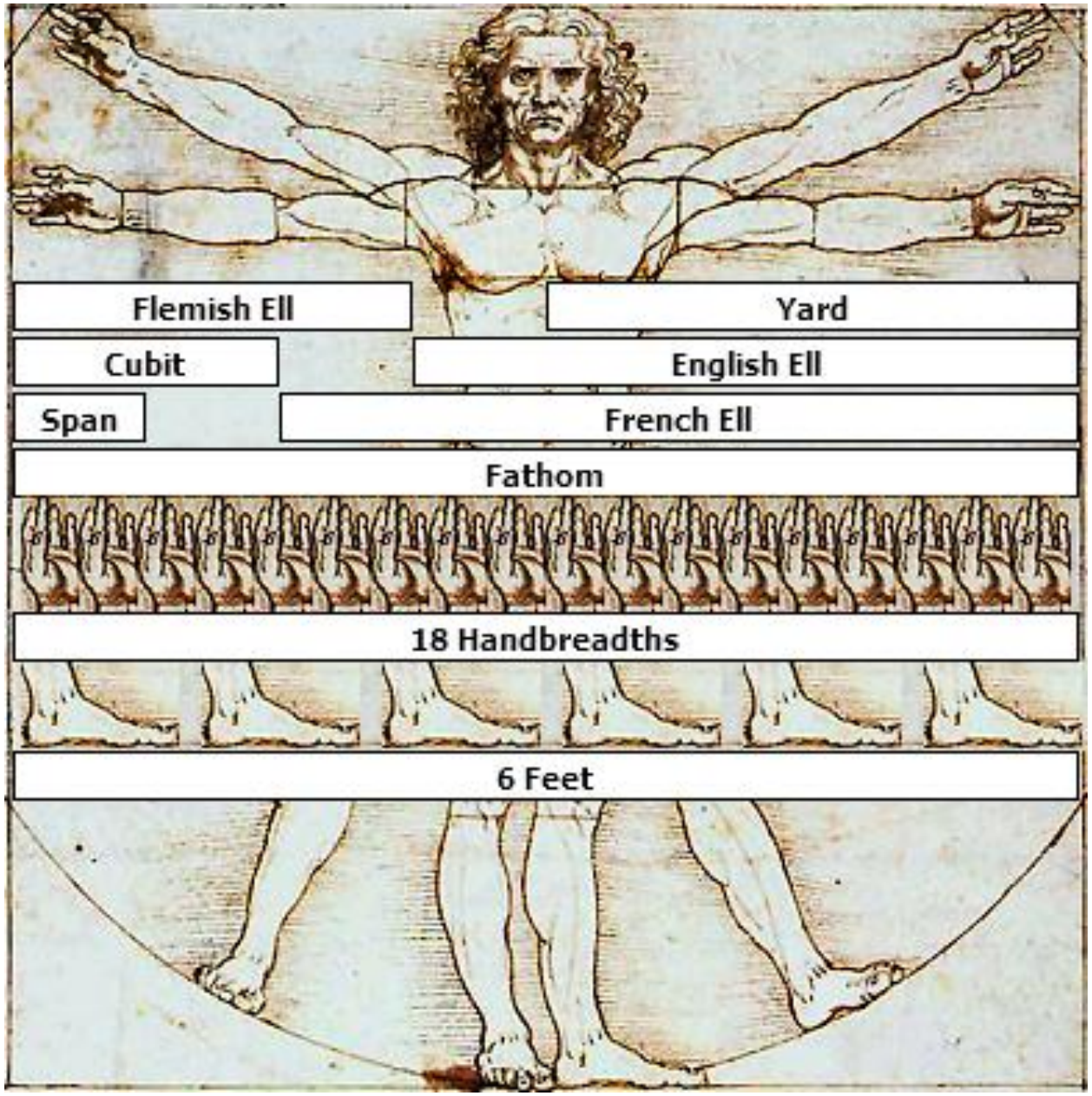
- Derived quantities are made of 2 or more base quantities combined by multiplication or division. Such as speed is given as miles-per-hour.

Derived quantities:

Name	Symbol	Unit	Symbol of unit	Composed of units?
Force	*F*	Newton	N	1.Kilogram 2. Metres per second per second
Velocity	*V*	Metres per second	M/s	1.Meters 2. Second
Pressure	*P*	Pascal	Pa	1. Force 2. Area
Energy, work	*E*	Joule	J	1. Force 2. Distance 3. second
Power	*P*	Watt	W	1. Joules 2. second
Frequency	*F*	Hertz	Hz	

Unit:

- Definition: A **unit of measurement** is a definite amount of a physical quantity, to which other objects or quantities are compared to define how much of something there is. E.g During mid-evil times one foot was defined as the distance, front to back, defined and adopted by convention and/or by law, that is used as a standard for measurement of the same physical quantity.


Flemish Ell
Yard
Cubit
English Ell
Span
French Ell
Fathom
18 Handbreadths
6 Feet

The metre examined:

- The meter is defined as $^{1}/_{10,000,000}$ of the distance from the Earth's equator to the North Pole measured on the circumference through Paris.

Quantity	Example of Imperial Unit	Example of S.I Unit
Length	Foot	Metre
Area	Acre	Sq. kilometre
Mass	Grain/ounce	Gram and kilogram