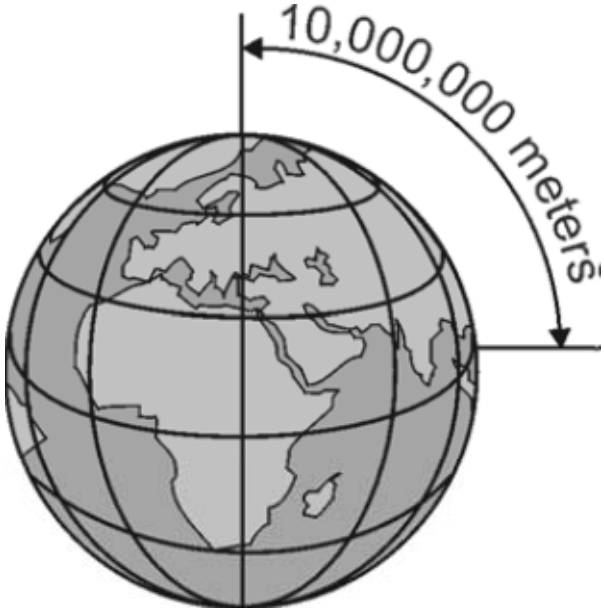
Introduction to the SI System

The **International System of Units**[1] (abbreviated **SI** from French: *Système international d'unités*[2]) is the modern form of the metric system and is generally a system of units of measurement devised around seven base units and the convenience of the number ten. The current SI system is overseen General Conference on Weights and Measures (as well as the International Bureau of Weights and Measures and the International Committee for Weights and Measures). These entities ensure the maximum usefulness of the system, and make changes as necessary.

The (original) metric system was conceived shortly after the French revolution by a group of scientists (among them, Antoine-Laurent Lavoisier, who is known as the "father of modern chemistry") who had been commissioned to create a unified and rational system of measures. From the graphic, how many kilometers is it from the North Pole to the equator? (*Answer:* 10,000 kilometers.)



The metric system is easy to use because all the units are based on factors of 10. In the English system, there are 12 inches in a foot, 3 feet in a yard, and 1,760 yards in a mile. In the metric system, there are 10 millimeters in a centimeter, 100 centimeters in a meter, and 1,000 meters in a kilometer.

PREFIXES

The following prefixes in the SI system indicate the multiplication factor to be used with the basic unit. For example, the prefix kilo- is for a factor of 1,000. A kilometer is equal to 1,000 meters and a kilogram is equal to 1,000 grams.

$1Km = 1x10^3m$ **because** 'k' means '$x10^3$'

Prefixes

pico-	p	0.000000000001	=10-12
nano-	n	0.000000001	=10-9
micro-	□	0.000001	=10-6
milli-	m	0.001	=10-3
centi-	c	0.01	=10-2
deci-	d	0.1	=10-1
deka-	da	10	=101
hecto-	h	100	=102
kilo-	k	1,000	=103
mega-	M	1,000,000	=106
giga-	G	1,000,000,000	=109
tera-	T	1, 000, 000, 000, 000	=1012

Units are divided into two classes—**base units** and **derived units**. There are seven base units, each representing, by convention, different kinds of physical quantities. Please know the following units for the test. Units in grey don't need to be memorized (yet).

	SI base units				
	Quantity	**Dimension**	**SI unit and symbol**	**Old Metric**	**Quantity symbol**
Base Units	Length	*L*	**metre (m)**		*l* (a lowercase L), *x*, *r*
	Mass	*M*	**kilogram (kg)***	gram (g)	*m*
	Time	*T*	**second (s)**	second (s)	*t*
	Temperature	Θ	**kelvin (K)**	centigrade (°C)	*T*
			degrees Celsius (°C)		
	Electric current	*I*	**ampere (A)**	international ampere	*I*
	Amount of substance	*N*	**mole (mol)**		*n*
	Luminous intensity	*J*	**candela (cd)**	Candlepower	I_v
Derived Units	Acceleration	LT^{-2}	**$(ms^{-2}) = (m/s^2)$**	galileo (gal) (cm/s^2)	*a*
	Energy	L^2MT^{-2}	**joule (J)**	erg (erg)	E
	Power	L^2MT^{-3}	**watt (W)**	(erg/s)	*p*
				horsepower (HP)	
	Force	LMT^{-2}	**newton (N)**	dyne (dyn)	F
	Pressure	$L^{-1}MT^{-2}$	**pascal (Pa)**	atmosphere (at)	P
	Frequency	T^{-1}	**hertz (Hz)**		*f*

***Despite the prefix "kilo-", the kilogram is the base unit of mass in the SI system. The kilogram, not the gram, is used in the definitions of derived units.**