



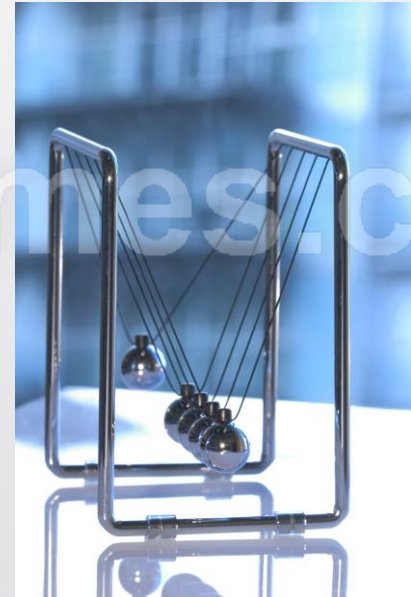
Physics and Measurements

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Physics

- Physics is the science of measurement .
- Physical quantity is any quantity that can be measured .



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Units of Measurement

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Mass

- The mass of an object is the amount of matter contained in this object .
- The mass is usually measured in kilograms but in USA it measured in pounds
- Examples
 1. Balance
 2. Top-Pan Balance
 3. Beam Balance





Volume

- Volume of an object is the amount of space occupied by the object.
- Volume is usually measured in cubic meter (m^3)
- There is two method to measure volumes
 1. Regular solids : can be calculated using ruler measurements
(Width , Height, Length)
 2. Irregular solids : displacement method

Displacement method

- Steps for measuring volume :
 1. Fill a measuring cylinder with water
 2. Take reading of the level of the water
 3. Wrap the irregular shaped solid with a wire
 4. Put in the cylinder
 5. Take the readings of the water
 6. Subtract the new reading from the old reading





Precautions for displacement methods

1. The measuring cylinder should be placed on a flat horizontal table.
2. You must take the reading while looking perpendicular to the cylinder to avoid parallax error
3. Use a string to lower the irregular shape being measured gently
4. The object must be completely submerged in water before taking the reading

Density

- Is the mass per unit volume of substance
- Density is a microscopic property of matter and it tells us about how concentrated the matter is
- It measures how closely packed the particles are.

$$\rho = \frac{m}{V}$$

S.I system of Units

- Scientists have worked out to measure any quantity in nature in terms of small number of base units.

Name of Quantity	Unit of measurement	Symbol for quantity	Symbol for unit
Length	Meter		m
Time	Second	t	s
Temperature	Kelvin	T	K
Mass	Kilogram	m	Kg
Electric Current	Ampere	I	A

Powers of Ten

		Prefix	Symbol	Example	
Multiple	10^9	Giga	G	Gigawatt	GW
	10^6	Mega	M	Megajoule	MJ
	10^3	Kilo	K	Kilogram	Kg
Submultiple	10^{-3}	milli	m	milliampere	mA
	10^{-6}	micro	μ	microcoulomb	μ C
	10^{-9}	nano	n	nanosecond	ns
	10^{-12}	Pico	P	picosecond	ps



THANK YOU

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Any Questions ?