



# SUPER PHYSICS

## Chapter 4 Notes

### Mass, Weight and Density

#### **Mass**

- The mass of a body is the amount of substance in the body
- Inertia: the ability to resist a change from its state of rest or motion is called inertia. The inertia of a body depends on its mass.

#### **Weight**

- The weight (force) of a body is the pull of gravity on the body due to gravitational attraction (acceleration)
- Hence  $\mathbf{F = ma}$  becomes  $\mathbf{W = mg}$

$$\mathbf{W = mg} \quad \text{where } W = \text{weight}$$

m = mass

g = gravity

#### **Gravitational Field Strength, g**

- Defined as gravitational force per unit mass
- Varies from place to place

#### **Difference between Mass and Weight**

	<b>Mass</b>	<b>Weight</b>
<b>Definition</b>	the amount of substance in a body	The gravitational pull acting on a body
<b>Dependent on location?</b>	No The weight is same on the Moon as on Earth	Yes The weight is different on the Moon from Earth
<b>Measured using?</b>	A beam balance	A spring balance
<b>Unit</b>	Kilogram	Newton

## Chapter 4: Mass, Weight and Density

### Density

- The density of a substance is defined as its mass per unit volume.
- Density = Mass/Volume
- SI unit:  $\text{kg m}^{-3}$