

Mass and Weight

Lesson Notes

What is Mass?

Definition: amount of stuff present in an object.

Metric Unit: kilogram (abbreviated kg)

Does not depend upon location; the same object has the same mass on all planets.

What is Weight?

Definition: the force of gravity acting upon an object.

Metric Unit: Newton (abbreviated N)

Does depend upon location; the same object weighs differently on different planets

Equation Relating Mass and Weight

$$\text{Weight} = F_{\text{grav}} = m \cdot g$$

where m = mass (kg) and g = gravitational field strength (in N/kg)

On Earth, $g = 9.8 \text{ N/kg}$

Check Your Understanding

Gravitational forces on the moon are one-sixth that of the earth. What is the mass and what is the weight of a 2.0-kg object on the Earth and on the moon?