GRAVITATION

SUBJECT-PHYSICS
CHAPTER NUMBER-10

LEARNING OBJECTIVE

Students will be able

• Define freefall.

Recapitulation

- State the universal law of gravitation.
- What are Important Characteristics of Gravitational forces?
- Calculate the value of g on the surface of earth.
- What do you mean by acceleration due to gravity?

What is Free Fall?

- When an object falls towards the earth due to earth's gravity and no other force is acting upon it, the object is said to be in free fall state. Free falling objects are not even resisted by the air.

- g = 9.8 m/s2 is also called the Free-fall Acceleration.

Clip related to free fall

https://www.youtube.com/watch?v=E43-CfukEgs

Q.A stone thrown vertically upwards reaches the maximum height in 3 m. if the acceleration of the stone be 10 m/s², calculate its initial velocity.
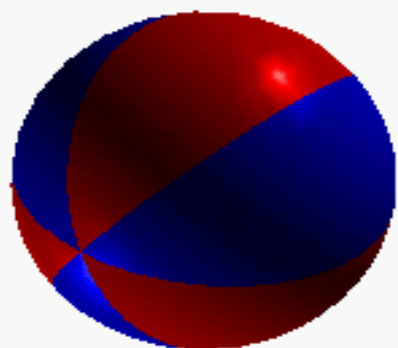
Free fall acceleration:

Free Falling Objects
(no air resistance)

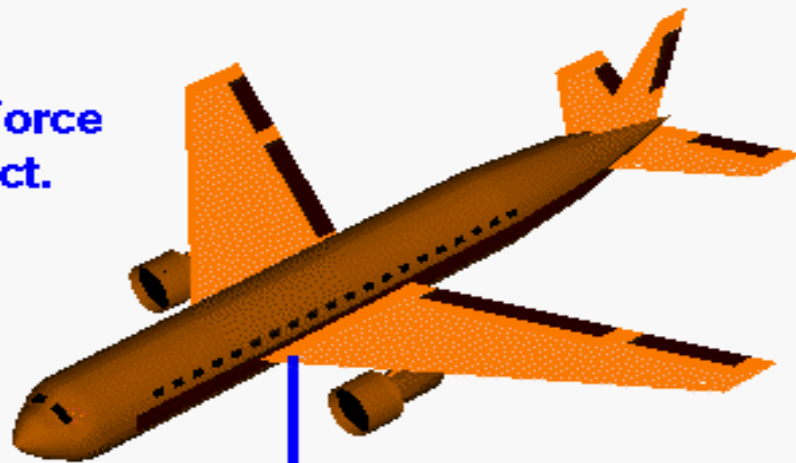Weight is the only Force
acting on the object.

$$F = W = m\ g$$

Weight

Weight

Motion of the object (Newton's second law).

$$F = m\ a$$

$$a = \frac{F}{m} = \frac{W}{m} = \frac{\cancel{m}\ g}{\cancel{m}}$$

$$a = g$$

Mass of the object does not affect the motion.
Shape of the object does not affect the motion.

All objects fall at the same rate in a vacuum. -- Galileo.

HOME ASSIGNMENT

- Write the formula to find the magnitude of the gravitational force between the earth and an object on the surface of the earth.

- What do you mean by free fall?

THANKING YOU
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