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GRAVITATION

SUBJECT-PHYSICS
CHAPTER NUMBER-10

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LEARNING OBJECTIVE

Students will be able

- Know importance of universal law of gravitation .
- Define gravitational force between two object.

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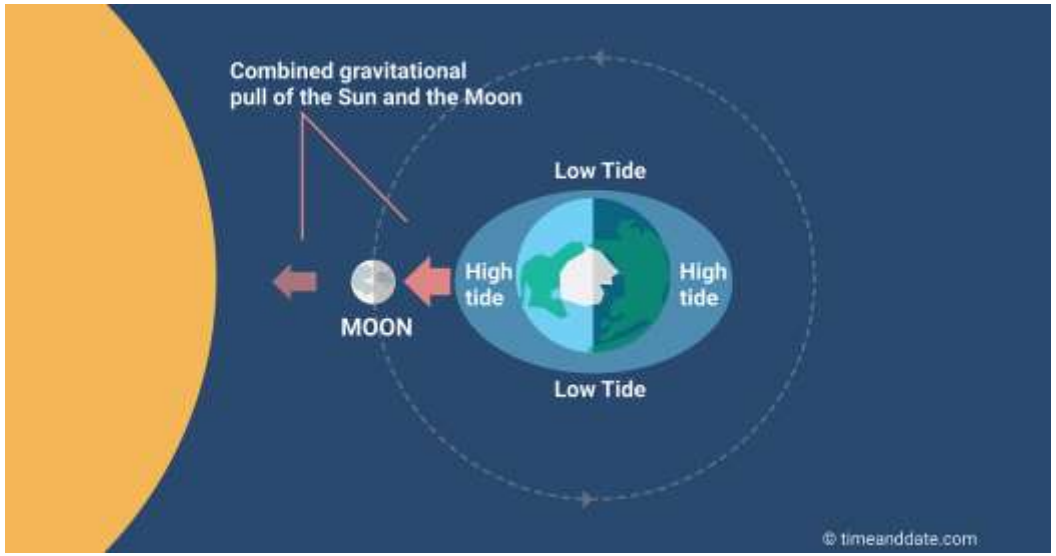
Recapitulation

- What is gravity ?
- What is gravitation force ?
- State the universal law of gravitation .
- What is the value of ‘G ‘?

Why we study the universal law of gravitation?

It explains many important phenomena of the universe

- Earth's gravitational force.
- Why the moon always moves in a circular motion around the earth and the sun?
- Why all planets revolve around the sun?
- How the sun and moon can cause tides?



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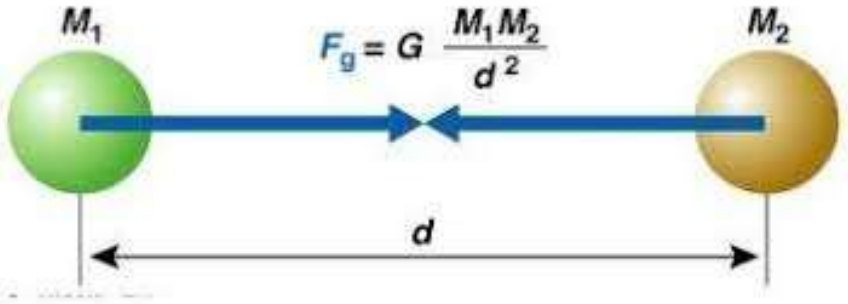

Gravitational force between two object

- Consider F is the force of attraction between an object on the surface of earth and earth.
- Also consider ‘m’ is the mass of the object on the surface of earth and ‘M’ is the mass

of earth.

- Therefore, the formula for magnitude of the gravitational force between the earth and an object on the surface is given as

$$\text{Gravitational force} = \frac{GMm}{r^2}$$

Q. The mass of the earth is 6×10^{24} kg and that of the moon is 7.4×10^{22} kg. If the distance between the earth and the moon is 3.84×10^{5} km, calculate the force exerted by the earth on the moon.

(Take G = 6.7 × 10–11 N m^2 kg^{-2})

HOME ASSIGNMENT

- Write the importance of universal law of gravitation.
- What does it mean to say that the Force of gravity is proportional to the masses of the bodies, and inversely proportional to the distance between them?

THANKING YOU
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