

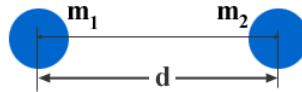
Answer on Question #40922, Physics, Mechanics | Kinematics | Dynamics

Two objects attract each other gravitationally with a force F . If the distance between their centers doubles, the gravitational force ...

Solution:

Every object in our universe attracts the other object with certain force towards its center. This force of attraction is known as GRAVITATIONAL FORCE and the phenomenon is called GRAVITATION.

In order to explain the gravitational force between two bodies, Newton formulated a fundamental law known after his name i.e. "NEWTON'S LAW OF GRAVITATION".



Newton's law of gravitation states that every object in the universe attracts the other object with a force and:

(1) The gravitational force of attraction between two bodies is directly proportional to the product of their masses.

$$F \propto m_1 \cdot m_2$$

(2) The gravitational force of attraction between two bodies is inversely proportional to the square of the distance between their centers.

$$F \propto \frac{1}{d^2}$$

If the distance between their centers doubles, the gravitational force is multiplied by a factor of $1/2^2 = 1/4$.

Answer. If the distance between their centers doubles, the gravitational force will decrease by 4 times.