

PRAYAG PUBLIC SCHOOL

SUBJECT: PHYSICS

STD: IX

GRAVITATION:

1. Estimate the mass of an object with weight 49 N.
2. When the masses are doubled and the separation is halved, what effect do they have on the gravitational force between the masses?
3. Why does g increase as we move from the equator to the poles?
4. Gravitational force acts on all objects in proportion to their masses. Why then a heavy object does not fall faster than a light object.
5. State Newton's Universal law of Gravitation. A stone is dropped from the top a 40 m high tower. Calculate its speed after 2 s, also find the speed with which the stone strikes the ground (Take $g = 10 \text{ m/s}^2$)
6. A force of 10 N acts on masses m_1 & m_2 to accelerate them 2 m/s^2 and 4 m/s^2 . If they are tied together, find the acceleration.
7. Distinguish between force of gravity and gravitational force.
8. An object is dropped from a certain point to fall freely under gravity. Write its equations of motion connection of (a) distance travelled, time taken and its acceleration. (b) final velocity, acceleration and the distance moved.
9. Find the height at which acceleration due to gravity becomes $\frac{1}{4}$ th of its value on the surface of the earth.
10. Two spheres of same radius ' r ' are made of same material of density ' d ' and separated by a distance of $(2r)$ m. find the force of attraction between them.
11. Write the importance of universal law of gravitation.
12. Derive an expression for the acceleration due to gravity.
13. Give three points of difference between mass and weight.
14. The earth is acted upon by gravitation of sun even though it does not fall into the sun. Why?
15. Imagine that you are visiting in planet Mars. If your weight on the earth is 450 N, What could be your weight on the Mars? (mass of Mars = $6 \times 10^{23} \text{ kg}$).