

Inclined plane, acting on a roller due to the gravitational pull of the earth.



Product Categories: [\(Class 11\)](#), [Physics Experiment](#)

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Product Page:

<https://www.labappara.com/product/find-downward-force-along-inclined-plane-acting-roller-due-gravitational-pull-earth/>

Product Description

Inclined Plane:

Objective:

To find the downward force along an inclined plane, acting on a roller due to the gravitational pull of the earth.

To study its relationship with the angle of inclination θ by plotting a graph between applied force and $\sin \theta$

Theory:

The inclined plane consists of a smooth plane hinged



]to a base so that it can be set at any desired angle. Consider a heavy metal roller connected to a scale pan by a light extensible string passing over a frictionless pulley resting on the plane as shown in the figure given below.

If a body of mass (say m) is placed over an inclined plane, that is inclined at an angle with the horizontal, its weight mg acts vertically downward. The component $mg \cos$ of the weight acts normally downward on the plane balances the upward normal reaction (say R) of the inclined plane.

The component $mg \sin$ of the weight acting parallel to the inclined plane downwards, produces motion in the body.

If total weight $W_1 = m_1g$ moves the body up and total weight $W_2 = m_2g$ makes the body move down,

Then the downward force acting on the body along the inclined plane, which must be equal to

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For a constant mass, m

Thus, a graph between $\sin \theta$ along X-axis and W along Y-axis must be a straight line.

Learning Outcomes:

Students understand the working of an inclined plane.

Students understand idea of normal reaction and downward force acting on an inclined plane.