



Inclined Plane

Recall that it is difficult to lift a heavy object straight up because you must apply a force great enough to overcome the downward pull of the force of gravity. For this reason people often use ramps. A ramp is an **inclined plane**, a simple machine that is a sloping surface. The photograph at the left shows the interior of the Guggenheim Museum in New York City. The levels of the art museum are actually one continuous inclined plane.

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Inclined planes make the work of raising an object easier because they support part of the weight of the object while it is being moved from one level to another. The surface of an inclined plane applies a reaction force on the object resting on it. This extra force on the object helps to act against gravity. If you are pushing an object up a ramp, you have to push with only enough force to overcome the smaller net force that pulls the object down parallel to the incline.

The less steep an inclined plane is, the less force you need to push or pull an object on the plane. This is because a less steep plane supports more of an object's weight than a steeper plane. However, the less steep an inclined plane is, the farther you must go to reach a certain height. While you use less force, you must apply that force over a greater distance.

Wedge



**CHECK YOUR
READING**

How do inclined planes help people do work?
Your answer should mention force.