

Block and Tackle

A block and tackle system consists of two or more pulleys threaded by ropes or cables, designed to gain mechanical advantage in lifting heavy loads.

Take two round objects with grooves around their edges, like wheels without their tires. These are called pulleys. A rope fits neatly inside these grooves.

The upper pulley has two hooks, one on top and one on bottom. The top hook is attached to the ceiling or a beam. A rope is tied to the bottom hook.

The rope loops down around a lower pulley that has one hook. The rope loops back up over the upper pulley and then back down to the ground where it is held by the operator.

The hook on the lower pulley is attached to a heavy object. The operator pulls the rope, and the heavy object is lifted.

The 100 kg object is lifted 2 m. The rope is pulled a total of 4 m. The force applied is 490.5 N.

Draw a diagram to illustrate the use of a block and tackle to lift a heavy object in a shop. Your diagram should include a heavy object, two pulleys, a rope, and a person operating the block and tackle. Incorporate the metric values when possible.