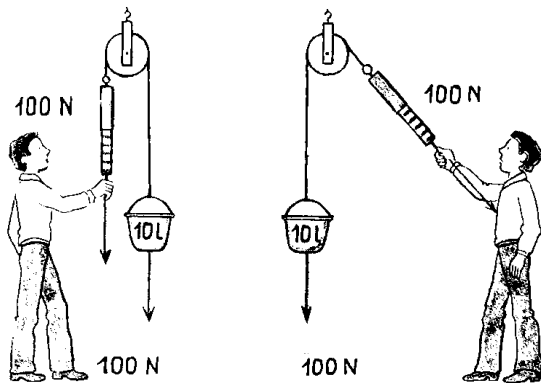
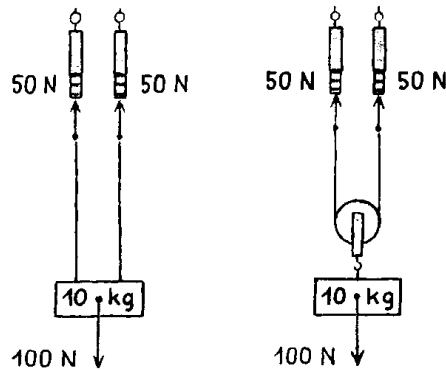


Block and tackle (pulley systems)

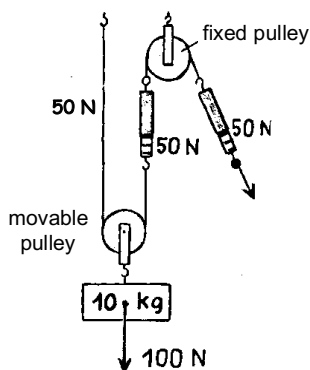
- ① Using a **fixed pulley**, you can change the direction of a force. The amount of force does not change.



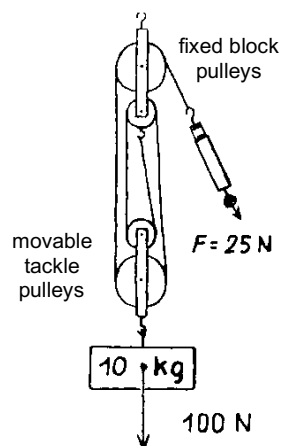
- ② Using a **movable pulley**, you can change the amount of force. The weight of the load is divided between the two ropes; each rope carries half of the load's weight.



- ③ Here's a combination of a **fixed and a movable pulley**: The movable pulley divides the weight of the load between two ropes while the fixed pulley merely changes the direction of the force.



- ④ A "block and tackle" is a system of ropes and pulleys, containing fixed and movable pulleys. The weight of the load is divided among several ropes. Here, each rope carries one quarter of the load's weight.



from: Physik für die Sekundarstufe I, Cornelsen Orell Füssli, page 97

A system of pulleys is an example of a simple machine. While the force needed to perform a task is reduced, the work remains the same.

- If we need half the force to lift an object using a pulley system, we must pull twice as much rope.
- If we need a third of the force to lift an object using a pulley system, we must pull three times as much rope.

The work done remains the same.