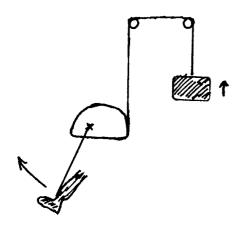
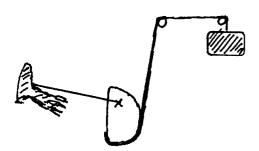


Since the wheel is round, the lever arm for the weight stack does not change as the leg goes through its motion. So the leg exerts the same force throughout the motion.



Now the wheel is replaced by a cam, which allows the lever arm for the weight stack to change during the motion. At the beginning of the motion, as shown to the left, the lever arm for the weight stack is relatively large, so the leg must exert a large force (i.e. the weight feels heavy).



Now the leg has moved, and rotated the cam such that the lever arm for the weight stack is smaller. Therefore the leg can exert a smaller force, and the weight feels lighter.

The reason some weight machines incorporate cams is to compensate for the fact that your muscles have different strengths over different parts of their motion (such as bending and straightening your leg, as in the machine on this page).