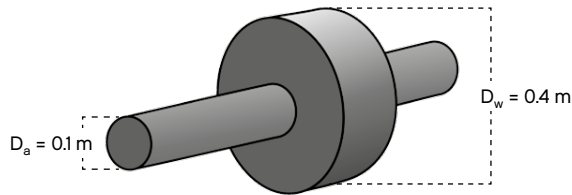


The mechanical advantage of a wheel and axle

The mechanical advantage of wheels and axles describes the ratio of rotation between the wheel and axle. Depending on where the effort is applied, the mechanical advantage can be calculated using the following formula:

$$\text{Mechanical advantage} = \frac{D_w}{D_a}$$



The mechanical advantage of this wheel and axle is 4:1 or 4 if the effort is applied to the axle. Meaning four times an increase in speed and distance, but at the same time a decrease in force by four times.

If the effort is applied to the wheel the mechanical advantage is 1:4, meaning a four times decrease in speed and distance, but four times increase in force.

 Hint:



The diameter of large LEGO® wheels are 43.2 mm (≈ 1.7 in).



The diameter of LEGO axles are 4.7 mm (≈ 0.18 in).