Equations Simple Machines
(Applied Science)

Work

W=Fd   **F =**   **d =**

How much work are you doing if you apply 135 N of force to climb 60 m up a ladder?
135 * 60 = 8100 J
How much force is required to climb up 30 meters of a ladder if you use 550 J of work to do it?
550 / 30 = 18.33 N

Power

$P = W/t$ **W =**   **t =**

How much power is required to perform 450 J of work in 30 seconds?
450 / 30 = 15 W
How much work is required to produce 550 W of power in 10 seconds?
550 * 10 = 5500 J

Mechanical Advantage

$MA = F_{out} / F_{in}$ **F_{out} =**   **F_{in} =**

What is the mechanical advantage for a machine that has an output force of 40 N when you input 67 N?

Efficiency

$e = W_{out}/ W_{in}$ *100   **W_{out} =**   **W_{in} =**

If a machine has an efficiency of 82% and you input 400 J our work, how much work will the machine perform?

MA for Lever

MA for Wheel and Axel

MA for Ramp