

$V = d/t$	$A = V_f - V_i / t$	$F = m \times a$
$W = F \times d$	$D = m / v$	$MA = F_r / F_e = D_e / D_r$

### CARS

1. If Lightning McQueen makes 25 loops around the 1-mi track in 30 min, how fast is he going (in mph)?
2. What is his acceleration from the starting line to his top speed (that you calculated in #1)?
3. What is Lightning's displacement from the starting line at the end of the race?
4. What is the mechanical advantage of the ramp to Mack's trailer if the trailer is 6ft off the ground and the ramp is 15ft long?
5. How long would the ramp need to be to make the mechanical advantage 5?
6. What is Lightning's weight (gravity=10 m/s<sup>2</sup>) if his mass is 1500kg?
7. Which of Newton's Laws does Lightning McQueen prove when he races Doc at the Butte? Explain.
8. How much work does Lightning McQueen do if he pulls Bessie with a force of 2000N for 500m?
9. What is the density of the tar in Bessie if it has a mass of 3000 kg and a volume of 5000L?
10. The wench on Mater is a pulley system. If the wench has 4 supporting ropes (going up), what is the mechanical advantage?
11. If Mater is able to lift with a max force of 5000N, what is the heaviest object he can move (in N)?