

# Physics Equations : Combined Science

Equation number	Word equation	Symbol equation
1	weight = mass × gravitational field strength ( $g$ )	$W = m g$
2	work done = force × distance (along the line of action of the force)	$W = F s$
3	force applied to a spring = spring constant × extension	$F = k e$
4	distance travelled = speed × time	$s = v t$
5	acceleration = $\frac{\text{change in velocity}}{\text{time taken}}$	$a = \frac{\Delta v}{t}$
6	resultant force = mass × acceleration	$F = m a$
7 HT	momentum = mass × velocity	$p = m v$
8	kinetic energy = $0.5 \times \text{mass} \times (\text{speed})^2$	$E_k = \frac{1}{2} m v^2$
9	gravitational potential energy = mass × gravitational field strength ( $g$ ) × height	$E_p = m g h$
10	power = $\frac{\text{energy transferred}}{\text{time}}$	$P = \frac{E}{t}$
11	power = $\frac{\text{work done}}{\text{time}}$	$P = \frac{W}{t}$
12	efficiency = $\frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$	
13	efficiency = $\frac{\text{useful power output}}{\text{total power input}}$	
14	wave speed = frequency × wavelength	$v = f \lambda$
15	charge flow = current × time	$Q = I t$
16	potential difference = current × resistance	$V = I R$
17	power = potential difference × current	$P = V I$
18	power = (current) <sup>2</sup> × resistance	$P = I^2 R$
19	energy transferred = power × time	$E = P t$
20	energy transferred = charge flow × potential difference	$E = Q V$
21	density = $\frac{\text{mass}}{\text{volume}}$	$\rho = \frac{m}{V}$