

## GCSE Physics Equations (you MUST learn these!)

Equation Number	Word Equation	Symbol Equation
1	weight = mass × gravitational field strength	$W = m g$
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	moment of a force = force × distance normal to direction of force	$M = F d$
5	pressure = force normal to surface / area of that surface	$P = F / A$
6	distance travelled = speed × time	$s = v t$
7	acceleration = change in velocity / time taken	$a = \Delta v / t$
8	resultant force = mass × acceleration	$F = m a$
9	momentum = mass × velocity	$p = m v$
10	kinetic energy = $0.5 \times$ mass $\times$ speed <sup>2</sup>	$E_k = 0.5 m v^2$
11	gravitational potential energy = mass × gravitational field strength × height	$E_p = m g h$
12	power = energy transferred / time	$P = E / t$
13	power = work done / time	$P = W / t$
14	efficiency = useful output energy transfer / total input energy transfer	
15	efficiency = useful power output / total power input	
16	wave speed = frequency × wavelength	$v = f \lambda$
17	charge flow = current × time	$Q = I t$
18	potential difference = current × resistance	$V = I R$
19	power = potential difference × current	$P = V I$
20	power = current <sup>2</sup> × resistance	$P = I^2 R$
21	energy transferred = power × time	$E = P t$
22	energy transferred = charge flow × potential difference	$E = Q V$
23	density = mass / volume	$\rho = m / v$

### Units:

Time – seconds	Length – metres	Current – amps
Mass – kilograms	Energy – joules	Power - watts
Voltage (PD) - volts	Resistance - ohms	Charge - coulombs
Frequency - hertz		

*You can add the unit symbols on yourself for revision.*