

GCSE Sciences: Physics Equations to Learn

If you're taking **GCSE (9–1) Combined Science** or **GCSE (9–1) Physics**, you need to know these equations:

distance travelled = average speed × time		
acceleration =	$\frac{\text{change in velocity}}{\text{time taken}}$	$a = \frac{(v - u)}{t}$
force = mass × acceleration		$F = m \times a$
weight = mass × gravitational field strength		$W = m \times g$
efficiency =	$\frac{\text{(useful energy transferred by the device)}}{\text{(total energy supplied to the device)}}$	
HT	momentum = mass × velocity	$p = m \times v$
wave speed = frequency × wavelength		$v = f \times \lambda$
wave speed = distance ÷ time		$v = \frac{x}{t}$
density = mass ÷ volume		$\rho = \frac{m}{V}$
work done = force × distance moved in direction of force		$E = F \times d$
change in gravitational potential energy = mass × gravitational field strength × change in vertical height		$\Delta GPE = m \times g \times \Delta h$
kinetic energy = $\frac{1}{2}$ × mass × (speed) ²		$KE = \frac{1}{2} \times m \times v^2$
power = work done ÷ time taken		$P = \frac{E}{t}$
energy transferred = charge moved × potential difference		$E = Q \times V$
charge = current × time		$Q = I \times t$
potential difference = current × resistance		$V = I \times R$
power = energy transferred ÷ time taken		$P = \frac{E}{t}$
electrical power = current × potential difference		$P = I \times V$
electrical power = current squared × resistance		$P = I^2 \times R$
force exerted on a spring = spring constant × extension		$F = k \times x$

If you're taking **GCSE (9–1) Physics**, you also need to learn these extra equations:

moment of a force = force × distance normal to the direction of the force		
pressure = force normal to surface ÷ area of that surface		$P = \frac{F}{A}$