

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 = $\frac{1}{2} \times \text{mass} \times (\text{speed})^2$ | | $KE = \frac{1}{2} \times m \times v^2$ |
| 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 | | $P = \frac{F}{A}$ |