

**Paper Reference(s) 1SC0/1PH**  
**Pearson Edexcel Level 1/Level 2 GCSE (9–1)**

**Combined Science**  
**PAPER 3**  
**Higher Tier**

**May–June 2023 Assessment Window**

**Equation Booklet**

**DO NOT RETURN THIS BOOKLET WITH  
THE QUESTION PAPER.**

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

**HT = higher tier**

**distance travelled = average speed × time**

**acceleration = change in velocity ÷ time taken**

$$a = \frac{(v - u)}{t}$$

**force = mass × acceleration**

$$F = m \times a$$

**weight = mass × gravitational field strength**

$$W = m \times g$$

**HT**

**momentum = mass × velocity**

$$p = m \times v$$

**change in gravitational potential energy =  
mass × gravitational field strength ×  
change in vertical height**

$$\Delta \text{GPE} = m \times g \times \Delta h$$

**kinetic energy =  $\frac{1}{2} \times \text{mass} \times (\text{speed})^2$**

$$\text{KE} = \frac{1}{2} \times m \times v^2$$

**efficiency =  
(useful energy transferred by the device)  
(total energy supplied to the device)**

**wave speed = frequency × wavelength**

$$v = f \times \lambda$$

**wave speed = distance ÷ time**

$$v = \frac{x}{t}$$

**work done = force ×  
distance moved in the direction of  
the force**

$$E = F \times d$$

**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)<sup>2</sup> × resistance**

$$P = I^2 \times R$$

**density = mass ÷ volume**

$$\rho = \frac{m}{V}$$

**force exerted on a spring =  
spring constant × extension**

$$F = k \times x$$

**(final velocity)<sup>2</sup> – (initial velocity)<sup>2</sup> =  
2 × acceleration × distance**

$$v^2 - u^2 = 2 \times a \times x$$

**HT**

**force = change in momentum ÷ time**

$$F = \frac{(mv - mu)}{t}$$

**energy transferred = current ×  
potential difference × time**

$$E = I \times V \times t$$

**HT**

**force on a conductor at right angles  
to a magnetic field carrying a  
current = magnetic flux density ×  
current × length**

$$\mathbf{F = B \times I \times l}$$

**For transformers with 100% efficiency,  
potential difference across primary coil ×  
current in primary coil =  
potential difference across secondary coil  
× current in secondary coil**

$$\mathbf{V_P \times I_P = V_S \times I_S}$$

**change in thermal energy = mass ×  
specific heat capacity ×  
change in temperature**

$$\mathbf{\Delta Q = m \times c \times \Delta \theta}$$

**thermal energy for a change of state =  
mass × specific latent heat**

$$\mathbf{Q = m \times L}$$

**energy transferred in stretching =  
0.5 × spring constant × (extension)<sup>2</sup>**

$$E = \frac{1}{2} \times k \times x^2$$

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

**moment of a force = force ×  
distance normal to the direction of  
the force**

**pressure = force normal to surface ÷  
area of surface**

$$P = \frac{F}{A}$$

**HT**

**potential difference  
across primary coil**  


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**potential difference  
across secondary coil**  


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**number of turns in primary coil**  


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**number of turns in secondary coil**

$$\frac{V_p}{V_s} = \frac{N_p}{N_s}$$



**to calculate pressure or volume for gases  
of fixed mass at constant temperature**

$$P_1 \times V_1 = P_2 \times V_2$$

**HT**

**pressure due to a column of liquid =  
height of column × density of liquid  
× gravitational field strength**

$$P = h \times \rho \times g$$

**END OF EQUATION LIST**