Pearson Edexcel Level 1/Level 2 GCSE (9–1)

May–June 2022 Assessment Window

Syllabus reference **1PH0 1SC0**

# Physics

# Combined Science (Physics)

## Equations List

**You are not permitted to take this notice into the examination.**
**A version of this equation list will be included with the May-June 2022 question papers. This document is valid if downloaded from the Pearson Qualifications website.**

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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** | $\boldsymbol{p} = \boldsymbol{m} \times \boldsymbol{v}$ |
| | change in gravitational potential energy = mass × gravitational field strength × change in vertical height | $\Delta GPE = m \times g \times \Delta h$ |
| | kinetic energy = 1/2 × mass × (speed)$^2$ | $KE = \frac{1}{2} \times m \times v^2$ |
| | efficiency = $\frac{(\text{useful energy transferred by the device})}{(\text{total energy supplied to the device})}$ | |
| | 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)$^2$ × 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)$^2$ – (initial velocity)$^2$ = 2 × acceleration × distance | $v^2 - u^2 = 2 \times a \times x$ |
| **HT** | **force = change in momentum ÷ time** | $\boldsymbol{F = \frac{(mv - mu)}{t}}$ |
| | 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** | $\boldsymbol{F = B \times I \times l}$ |
| | For transformers with 100% efficiency, potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil | $V_P \times I_P = V_S \times I_S$ |
| | change in thermal energy = mass × specific heat capacity × change in temperature | $\Delta Q = m \times c \times \Delta\theta$ |
| | thermal energy for a change of state = mass × specific latent heat | $Q = m \times L$ |
| | energy transferred in stretching = 0.5 × spring constant × (extension)$^2$ | $E = \frac{1}{2} \times k \times x^2$ |

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** | $\boldsymbol{\frac{\text{potential difference across primary coil}}{\text{potential difference across secondary coil}} = \frac{\text{number of turns in primary coil}}{\text{number of turns in secondary coil}}}$ | $\boldsymbol{\frac{V_p}{V_S} = \frac{N_p}{N_S}}$ |
| | 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** | $\boldsymbol{P = h \times \rho \times g}$ |

**END OF EQUATION LIST**