GCSE Physics Formula by topic

Students need to be able to recall….

SP1	
distance travelled = average speed × time	$d = s \times t$
acceleration = change in velocity ÷ time taken	$a = \frac{(v - u)}{t}$
SP2	
force = mass × acceleration	$F = m \times a$
weight = mass × gravitational field strength	$W = m \times g$
momentum = mass × velocity (Higher)	$p = m \times v$
work done = force × distance moved in the direction of the force	$E = F \times d$
kinetic energy = ½ × mass × (velocity)^2	$KE = ½ \times m \times v^2$
SP3	
efficiency = $\frac{\text{(useful energy transferred by the device)}}{\text{(total energy supplied to the device)}}$	
gravitational potential energy = mass × gravitational field strength x change in vertical height	$\Delta GPE = m \times g \times \Delta h$
kinetic energy = ½ × mass × (velocity)^2	$KE = ½ \times m \times v^2$
SP4	
wave velocity = frequency x wavelength	$v = f \times \lambda$
wave speed = $\frac{\text{distance}}{\text{time}}$	$v = \frac{d}{t}$
SP8	
work done = force × distance moved in the direction of the force	$E = F \times d$
power = work done ÷ time taken	$P = \frac{E}{t}$
SP9	
moment of a force = force × distance normal to the direction of the force	
SP10	
charge = current × time	$Q = I \times t$
energy transferred = charge moved × potential difference	$E = Q \times V$
potential difference = current × resistance	$V = I \times R$
power = energy transferred (joule, J) ÷ time taken	$P = \frac{E}{t}$
electrical power = current × potential difference	$P = I \times V$
electrical power = current squared × resistance	$P = I^2 \times R$
SP14	
density = mass ÷ volume	$\rho = \frac{m}{V}$
SP15	
force exerted on a spring = spring constant × extension	$F = k \times x$
pressure = force normal to surface ÷ area of surface	$P = \frac{F}{A}$

Students may be asked to apply…..

SP1	
(final velocity)^2 – (initial velocity)^2 = 2 × acceleration × distance	$v^2 - u^2 = 2 \times a \times x$
SP2	
force = change in momentum ÷ time (Higher)	$F = \frac{(mv - mu)}{t}$
SP10	
energy transferred = current × potential difference × time	E = I x V x t
SP12	
force on conductor at right angle to a magnetic field carrying a current = magnetic flux density × current × length (Higher)	F = B × I × L
voltage across primary coil = number of turns in primary coil voltage across secondary coil number of turns in secondary	$\frac{V_p}{V_s} = \frac{N_p}{N_s}$
(pd × current) in primary coil = (pd × current) in secondary coil	$V_p \times I_p = V_s \times I_s$
SP14	
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 × L
to calculate pressure or volume for gases of fixed mass at constant temperature	$P_1 \times V_1 = P_2 \times V_2$
SP15	
energy transferred in stretching = 0.5 × spring constant × (extension)^2	$E = ½ \times k \times x^2$
pressure due to a column of liquid = height of column × density of liquid × gravitational field strength	$P = h \times \rho \times g$