

WJEC PH4

Spec Ref	Topic	TAP episode	comments
4.1	the radian, angular velocity $v = \omega r$, $a = \omega^2 r$,	225	
	SHM $a = -\omega^2 r$, $v = A \omega \cos(\omega t + \varepsilon)$	301, 302	
	$x = A \sin(\omega t + \varepsilon)$, phase $(\omega t + \varepsilon)$, $T = 2\pi v(m/k)$	302, 303	
	energy changes in SHM	305	
	free & damped oscillations, critical damping	306	
	forced oscillations and resonance, uses and problems	307	
4.2	force & conservation of momentum	220, 222	
	momentum of a photon $p = h/\lambda = hf/c$	506	
	radiation pressure.		No reference
4.3	Boyles law, $pV = nRT$, Kelvin scale	601, 602	
	kinetic theory of gases $pV = \frac{1}{3} \rho c^2$,	603	
	Avogadro & the mole, molar mass	602	
	kinetic energy of a gas = $\frac{1}{2}kT$	603	
	internal energy $U = \frac{3}{2}nRT$, $W = p \Delta V$	605	For 'work done' only
	first law of thermodynamics, $\Delta U = Q - W$	605	
	for a solid (or liquid) $Q = \Delta U$		No reference
	$Q = mc \Delta \theta$	607	
4.4	Electric fields, Coulomb's Law	406	
	electric potential, $E = -\Delta V/\Delta r$	407	
	Newton's Law of gravitation, $g = Gm/r^2$	401, 402	
	gravitational potential	404	
	gravitational field, field lines, equipotentials, $\Delta U_p = mg\Delta h$	404	
4.5	derive Kepler's Laws	403	
	spiral galaxies and existence of dark matter;	705	Not 'spiral galaxies'
	centre of mass of two orbiting masses		No ref
	Doppler shift, $v/c = \Delta \lambda / \lambda$	702	
	calculate a star's radial velocity		No ref
	double system's orbital period		No ref