AQA physics Higher tier revision checklist

	Revised on carousel	Exam questions attempted
Energy		
Energy stores: Chemical, Kinetic, Gravitational Potential, Elastic Potential, Thermal.		
Energy transfers: Mechanically, Electrically, Heating, Radiation.		
Conservation of energy: Total energy is conserved; energy cannot be created or destroyed.		
Efficiency: Useful output energy / Total input energy.		
Kinetic energy: Ek = 0.5 * m * v^2.		
Gravitational potential energy: Ep = m * g * h.		
Power: P = E / t, P = W / t.		
Specific heat capacity: ΔE = m * c * Δθ.		
Energy resources: Renewable (solar, wind, hydroelectric, etc.) vs. Non-renewable (fossil fuels, nuclear).		
Electricity		
Current, potential difference, resistance: V = I * R (Ohm's law).		
Series and parallel circuits: Current, voltage, and resistance in series/parallel circuits.		
Power in electrical circuits: P = V * I, P = I^2 * R, P = V^2 / R.		
Mains electricity: UK mains voltage (230V), alternating current (AC) vs. direct current (DC).		
Electrical safety: Fuses, circuit breakers, earthing, insulation.		
Charge and energy: E = Q * V, where Q = I * t.		
Particle Model of Matter		
States of matter: Solid, liquid, gas.		
Density: ρ = m / V.		
Internal energy: Sum of kinetic and potential energy of particles.		
Changes of state: Melting, boiling, freezing, condensation; specific latent heat.		
Specific latent heat: E = m * L (fusion and vaporisation).		
Pressure in gases: Relationship between pressure, volume, and temperature (qualitative).		
Atomic Structure		
Structure of the atom: Protons, neutrons, electrons; nucleus and electron orbits.		
Mass and atomic numbers: Number of protons = atomic number.		
Isotopes: Same element, different number of neutrons.		
Radioactive decay: Alpha, beta, gamma radiation; properties and uses.		
Half-life: Time taken for half of the radioactive nuclei to decay.		
Nuclear fission: Splitting large isotopes.		
Nuclear fusion: Small nuclei joining and producing energy.		
Forces		
Scalar and vector quantities: Scalars (magnitude only) vs. Vectors (magnitude and direction).		
Contact and non-contact forces: Gravity, electrostatic, magnetic, friction, tension.		
Weight: W = m * g, where g = 9.8 N/kg.		
Resultant force: Net force acting on an object; effect on motion.		

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Newton's Laws:		
1st Law: Inertia – objects remain in uniform motion or at rest unless acted upon by an unbalanced force.		
2nd Law: F = m * a.		
3rd Law: Every action has an equal and opposite reaction.		
Work done: W = F * d.		
Moments: Moment = force * distance from the pivot.		
Hooke's Law: F = k * Δx (force is proportional to extension until the limit of proportionality is reached).		
Waves		
Transverse and longitudinal waves: Properties and examples.		
Wave speed: v = f * λ, where f = frequency and λ = wavelength.		
Reflection, refraction, diffraction: Key behaviors of waves.		
Electromagnetic spectrum: From radio waves to gamma rays; uses and dangers.		
Sound waves: Frequency, pitch, and the speed of sound.		
Wave equation: v = f * λ (wave speed = frequency * wavelength).		
Magnetism and Electromagnetism		
Permanent and induced magnets: Differences between permanent and temporary magnets.		
Magnetic fields: Representation and direction of field lines.		
Electromagnetism: Magnetic field produced by a current-carrying wire.		
The motor effect: Force on a current-carrying conductor in a magnetic field.		
Electric motors: Qualitative understanding of how electric motors work.		
Electromagnetic induction: Generation of voltage by moving a conductor through a magnetic field.		
Transformers: How they work and how do you do the calculations.		
Space Physics (Separate Science Only)		
The Solar System: Planets, moons, and their orbits.		
Life cycle of stars: From nebula to main sequence star, red giant/supergiant, and then either a white dwarf, neutron star, or black hole.		
Redshift: Evidence for the expansion of the universe.		
The Big Bang Theory: The origin of the universe and supporting evidence (cosmic background radiation, etc.)		