Y13

Revision Olympics

A Level Physics

Revision Guide

December 2024–May 2025

Exam Specification and General Support

Exam specification and exam board	AQA – 7480A
Past paper questions	https://www.aqa.org.uk/subjects/physics/as-level/physics-7407/assessment-resources
Useful revision websites	SENECA COGNITO Knowledge organisers on teams
Exam info	24 May 2025 –Paper 1 6 June 2025 –Paper 2 17 June 2025 –Paper 3

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Week	Activity 1	Activity 2
1 2.12.24	**Measurements and Errors** Key Topics: • Units and SI base units • Precision, accuracy, and uncertainty • Significant figures • Random and systematic errors • Propagation of errors • Calibration Focus: Develop an understanding of uncertainty and error analysis. Practice applying these concepts to real-world examples.	Complete the relevant Knowledge Organiser sheets on teams. • Theory: Study how to calculate uncertainty and error propagation. • Practical: Work through experiments that involve measurement, calculating uncertainties (e.g., measuring length, mass, time). • Questions: Practice questions on calculating percentage uncertainty.
2 9.12.24	**Particles and Radiation** Key Topics: • Structure of the atom • Subatomic particles (protons, neutrons, electrons) • Rutherford's model, Bohr's model • Isotopes Focus: Study the composition of atoms and atomic models, including the history behind their development.	Complete the relevant Knowledge Organiser sheets on teams. • Study the structure and types of fundamental particles. • Review conservation of charge, energy, and momentum in particle interactions. • Work through problems on particle reactions and accelerators.
3 16.12.24	**Waves** Key Topics: • Wave properties • Types of waves (transverse and longitudinal) • Wave equation v=fλv = f \lambdav=fλ • Reflection, refraction, diffraction Focus: Master wave behavior, including wave equations and phenomena like interference and diffraction.	Complete the relevant Knowledge Organiser sheets on teams. • Revise key wave equations and properties. • Work on examples of wave interference and diffraction patterns. • Solve problems on wave speed and frequency.

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XMAS BREAK (week 1)	**Mechanics** Key Topics: • Scalars and vectors • Speed, velocity, acceleration • Displacement, uniform acceleration equations (SUVAT) Focus: Learn to apply SUVAT equations to solve problems related to motion	Complete the relevant Knowledge Organiser sheets on teams. • Practice problems on velocity, acceleration, and displacement. • Study the relationship between momentum and force. • Work on solving Newton's second law and momentum conservation questions.
XMAS BREAK (week 2)	**Materials** Key Topics: • Stress and strain • Hooke's Law, Young's Modulus • Elastic and plastic deformation • Energy stored in a stretched object Focus: Understand how materials respond to stress and strain and apply these principles in problem-solving.	Complete the relevant Knowledge Organiser sheets on teams. • Review how materials deform under stress and strain. • Practice calculating Young's Modulus and Hooke's Law problems. • Experiment with elastic materials (spring constant or Young's Modulus).
4 6.01.25	Electric charge, current, voltage, resistance Ohm's Law, power, energy in electrical circuits Series and parallel circuits Focus: Build a strong foundation in electrical circuits, understanding key concepts like current, voltage, and resistance.	Complete the relevant Knowledge Organiser sheets on teams. • Revise the behavior of current, voltage, and resistance. • Solve circuit problems involving series and parallel arrangements. • Work through questions involving Kirchhoff's laws.
5 13.01.25	**Further Mechanics** Key Topics: • Newton's laws • Forces, friction, tension, equilibrium • Circular motion, centripetal force Focus: Master Newton's laws, understand the forces involved in equilibrium, and work through problems involving circular motion.	Complete the relevant Knowledge Organiser sheets on teams. • Study work-energy motion problems (centripetal force and acceleration). • Investigate examples of energy transfer in mechanical systems.

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6 20.01.25	**Circular Motion** Key Topics: • Uniform circular motion • Angular velocity, centripetal force, centripetal acceleration • Period, frequency, angular frequency Focus: Explore the relationship between linear and angular quantities in circular motion, and solve problems involving centripetal forces.	Complete the relevant Knowledge Organiser sheets on teams. • Study the equations for circular motion and angular velocity. • Solve problems on centripetal force, angular momentum, and orbital motion. • Work through questions on planetary motion and Kepler's laws.
7 27.01.25	**Thermal Physics** Key Topics: • Temperature, internal energy, heat • Specific heat capacity • Latent heat, specific latent heat Focus: Understand the principles of thermal energy transfer, and apply concepts of specific heat capacity and latent heat in problem-solving.	Complete the relevant Knowledge Organiser sheets on teams. • Practice calculations with the ideal gas law and specific heat. • Study and apply concepts of latent heat in phase changes. • Work through thermal energy transfer problems.
8 3.02.25	**Electrical Fields** Key Topics: • Electric field strength, Coulomb's Law • Electric potential energy, potential difference • Capacitance Focus: Develop a strong understanding of electric fields and potential, and apply these concepts to problems involving electric circuits.	Complete the relevant Knowledge Organiser sheets on teams. • Study the relationship between electric field strength, potential, and charge. • Review energy stored in electric fields and capacitors.

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9 10.02.25	**Capacitors** Key Topics: • Capacitance, energy stored in a capacitor • Charging and discharging of capacitors • Time constant Focus: Master the concepts of capacitance, including the processes of charging and discharging capacitors, and solve related problems.	Complete the relevant Knowledge Organiser sheets on teams. • Review the formulae for capacitance and energy storage. • Study the charging and discharging of capacitors in RC circuits. • Solve problems on time constants and exponential decay.
HALF TERM	**Gravitational Fields** Key Topics: • Gravitational force, gravitational field strength • Newton's law of gravitation • Gravitational potential, Kepler's laws, orbits • Escape velocity Focus: Understand gravitational forces and orbits, and solve problems related to escape velocity and planetary motion.	Complete the relevant Knowledge Organiser sheets on teams. • Study the relationship between force, field strength, and gravitational potential. • Solve orbital motion problems, including energy in orbits. • Understand and apply Kepler's Laws.
10 24.02.25	Mock Exams	
11 3.03.25	Mock Exams	
12 10.03.25	**Magnetic Fields** Key Topics: • Magnetic field lines, force on a current-carrying conductor • Magnetic flux, electromagnetic induction • Faraday's Law, Lenz's Law Focus: Study the principles of electromagnetic induction, and solve problems related to magnetic fields and induced EMF.	Complete the relevant Knowledge Organiser sheets on teams. • Practice problems on magnetic force and motion of charged particles. • Study the behavior of magnetic fields in various configurations. • Solve problems on induced emf and magnetic flux.

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13 17.03.25	**Particles and Radiation** Key Topics: • Types of radiation (alpha, beta, gamma) • Radioactive decay, half-life, activity • Nuclear reactions, properties of radiation Focus: Understand radioactive decay, half-life calculations, and the different types of nuclear radiation.	
14 24.03.25	**Nuclear Physics** Key Topics: • Nuclear decay, alpha, beta, gamma radiation • Half-life, activity, nuclear reactions • Energy release from fission and fusion, binding energy Focus: Understand the process of nuclear decay and the energy Nuclear Physics, and Simple Harmonic Motion**	Complete the relevant Knowledge Organiser sheets on teams. • Study the types of nuclear reactions: fission and fusion. • Work through problems related to energy released in nuclear reactions. • Review half-life calculations and applications in radiometric dating.
15 31.03.25	**Nuclear Physics** Key Topics: • Nuclear fission, nuclear fusion • Chain reactions, energy released in nuclear processes • Application of nuclear physics (e.g., nuclear reactors, stars) Focus: Apply knowledge of fission and fusion in practical scenarios, and explore their role in energy production.	Complete the relevant Knowledge Organiser sheets on teams. • Study the processes of fission and fusion and their applications. • Review the energy released in both processes. • Solve questions on fission, fusion, and energy balance.

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EASTER BREAK (week 1)	**Astrophysics** Key Topics: • Stellar evolution, life cycle of stars • Protostar, main sequence, red giants, white dwarfs • Supernovae, black holes, neutron stars Focus: Learn about the formation and evolution of stars, and understand the key stages of stellar life cycles.	Complete the relevant Knowledge Organiser sheets on teams. • Study the evolution of stars from nebula to black hole or white dwarf. • Review evidence for the Big Bang and the expanding universe. • Solve questions on redshift and calculate the distance to galaxies using Hubble's Law.
EASTER BREAK (week 2)	**Simple Harmonic Motion (SHM)** Key Topics: • Conditions for SHM, displacement-time graphs • Acceleration-time graphs, velocity-time graphs • Period, frequency, angular frequency • Energy in SHM, damping, resonance Focus: Master SHM principles and their mathematical descriptions. Solve problems related to oscillatory motion, resonance, and energy transfer.	Complete the relevant Knowledge Organiser sheets on teams. • Displacement, Velocity, and Acceleration in SHM • Energy in SHM • Damped and Forced Oscillations
16 21.04.25	**Electrical Fields and Potential** Key Topics: • Electric field lines, potential difference • Electric potential, capacitance • Equipotential surfaces Focus: Study electric potential and capacitance, and solve problems involving electric fields in both uniform and non-uniform configurations.	Complete the relevant Knowledge Organiser sheets on teams. • Study the relationship between electric field strength, potential, and charge. • Review energy stored in electric fields and capacitors.

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Week	Activity 1	Activity 2
17 28.04.25	**Waves Key Topics** • Wave motion, wave equation v=fλ • Transverse and longitudinal waves, superposition, interference • Diffraction, Doppler effect Focus: Understand the behavior of waves, including interference patterns, and the Doppler effect. Apply wave equations to real-world examples.	Complete the relevant Knowledge Organiser sheets on teams. • Revise key wave equations and properties. • Work on examples of wave interference and diffraction patterns. • Solve problems on wave speed and frequency.
18 5.05.25	**Quantum Phenomena** Key Topics: • Photoelectric effect, wave-particle duality • Photons, energy of photons • Particle nature of light, quantum mechanics Focus: Explore the dual nature of light, and understand the quantum explanation of phenomena such as the photoelectric effect.	Complete the relevant Knowledge Organiser sheets on teams. • Revise the photoelectric effect and its explanation through quantum theory. • Work on solving problems related to energy levels and photon emission. • Study the uncertainty principle and its implications for measurements.
19 12.05.25	**Topic Reviews and Consolidation** • Key Topics: Review all topics, focusing on weak areas. Create mind maps, flashcards, and summary sheets to reinforce key ideas. • Focus: Deep revision of critical topics, focusing on areas that need more attention, such as Quantum Phenomena, Astrophysics, and Circular Motion.	
20 19.05.25	**Practice Past Papers and Timed Questions** • Key Focus: Complete past exam papers under timed conditions. Review model answers to understand the exam technique and mark schemes. • Final Review: Focus on refining exam technique, especially for long-answer questionsly quiz yourself on key concepts, formulas, and definitions. • Past Papers: Solve multiple past exam papers to familiarize yourself with question formats and timing. • Formula Sheets: Be comfortable with the formula sheet, especially for complex topics like Capacitors, Magnetic Fields, and Circular Motion. • Exam Technique: Focus on answering questions fully, especially those requiring detailed explanations. Practice writing concise and accurate responses under timed conditions.	