

# OCR Advancing Physics Revision

Development of practical skills in physics  
Fundamental data analysis

## Chapter 1 Imaging

- 1.1 Bending light with lenses
- 1.2 Finding the image
- 1.3 Storing and manipulating the image
- 1.4 Polarisation of electromagnetic waves

## Chapter 2 Signalling

- 2.1 Digitising a signal
- 2.2 Sampling sounds and sending a signal

## Chapter 3 Sensing

- 3.1 Current, p.d. and electrical power
- 3.2 Conductors and resistors
- 3.3 Conductivity and resistivity
- 3.4 Conduction under the microscope
- 3.5 Potential dividers
- 3.6 E.m.f. and internal resistance

## Chapter 4 Testing Materials

- 4.1 Describing materials
- 4.2 Stretching wires and springs
- 4.3 Stress, strain, and the Young Modulus
- 4.4 Choosing materials

## Chapter 5 Looking inside materials

- 5.1 Materials under the microscope
- 5.2 Modelling material behaviour
- 5.3 Microscopic structures & macroscopic properties

## Chapter 6 Wave behaviour

- 6.1 Superposition of waves
- 6.2 Light, waves, and refraction
- 6.3 Path difference and phase difference
- 6.4 Interference and diffraction of light

## Chapter 7 Quantum behaviour

- 7.1 Quantum behaviour
- 7.2 Quantum behaviour and probability
- 7.3 Electron diffraction

## Chapter 8 Motion

- 8.1 Graphs of motion
- 8.2 Vectors
- 8.3 Modelling motion
- 8.4 Speeding up and slowing down

## Chapter 9 Momentum, force, and energy

- 9.1 Conservation of momentum
- 9.2 Newton's laws on motion and momentum
- 9.3 Conservation of energy
- 9.4 Projectiles
- 9.5 Work and power

## Chapter 10 Modelling decay

- 10.1 Radioactive decay and half-life
- 10.2 Another way of looking at radioactivity
- 10.3 Capacitors in circuits
- 10.4 Modelling capacitors

## Chapter 11 Modelling oscillations

- 11.1 Introducing simple harmonic oscillators
- 11.2 Modelling simple harmonic oscillation
- 11.3 Using models of simple harmonic motion
- 11.4 Resonance

## Chapter 12 The Gravitational Field

- 12.1 Circular Motion
- 12.2 Newton's law of gravitation
- 12.3 Gravitational potential in a uniform field
- 12.4 Gravitational potential in a radial field

## Chapter 13 Our place in the Universe

- 13.1 Measuring the Solar System
- 13.2 Measuring the Universe
- 13.3 Special relativity

## Chapter 14 Simple models of matter

- 14.1 The gas laws
- 14.2 The kinetic model of matter
- 14.3 Energy in matter

## Chapter 15 The Boltzmann factor

- 15.1 The ratio  $E/kT$
- 15.2 The Boltzmann factor  $e^{-E/kT}$

## Chapter 16 Electromagnetism

- 16.1 Faraday and Lenz
- 16.2 Transformers
- 16.3 Generators
- 16.4 Flux changes and force

## Chapter 17 The Electric Field

- 17.1 Uniform electric fields
- 17.2 Deflecting charged beams
- 17.3 Charged spheres

## Chapter 18 Looking inside the atom

- 18.1 Probing the atom with alpha particles
- 18.2 Accelerating charges & electron scattering
- 18.3 Inside the nucleus
- 18.4 Creation and annihilation
- 18.5 Electrons in atoms

## Chapter 19 Using the atom

- 19.1 Ionising radiation
- 19.2 Effects of radiation on tissue
- 19.3 Stability and decay
- 19.4 Fission and fusion