



Unit 1: Movement

- Chapter 1: Fundamental Forces of Nature
- Chapter 2: Velocity
- Chapter 3: Acceleration
- Chapter 4: Using Graphs Instead of Formulas

Unit 2: Vectors

- Chapter 1: Speed and Direction
- Chapter 2: Adding Vectors
- Chapter 3: Tangent, Cosine, and Sine
- Chapter 4: X and Y Components of Vectors
- Chapter 5: Independence of X and Y Vectors
- Chapter 6: Newton's First Law
- Chapter 7: Angular Vector
- Chapter 8: Centripetal Acceleration

Unit 3: Forces

- Chapter 1: Newton's First Law
- Chapter 2: Newton's Second Law
- Chapter 3: Newton's Third Law
- Chapter 4: Static Friction
- Chapter 5: Kinetic Friction
- Chapter 6: Inclines
- Chapter 7: Pulleys

Unit 4: Energy, Work, and Power

- Chapter 1: Types of Energy
- Chapter 2: Chemical Energy
- Chapter 3: Mechanical Energy
- Chapter 4: Potential energy
- Chapter 5: Kinetic energy
- Chapter 6: Work
- Chapter 7: Springs
- Chapter 8: Conservation of Energy
- Chapter 9: Work
- Chapter 10: Momentum

Unit 5: Circular Motion

- Chapter 1: Radians
- Chapter 2: Angular Distance
- Chapter 3: Angular Velocity
- Chapter 4: Tangential Velocity
- Chapter 5: Centripetal Acceleration
- Chapter 6: Center of Rotation
- Chapter 7: Moment of Inertia
- Chapter 8: Torque
- Chapter 9: Angular Work
- Chapter 10: Power
- Chapter 11: Center of Gravity
- Chapter 12: Linear Momentum
- Chapter 13: Angular Momentum
- Chapter 14: Tangential vs. Angular Forces
- Chapter 15: Universal Law of Gravitation

Unit 6: Fluids and Gases

- Chapter 1: Buoyancy
- Chapter 2: Density vs. Weight
- Chapter 3: Displacement
- Chapter 4: Force, Pressure, and Area
- Chapter 5: Pressure in a Closed System
- Chapter 6: Hydraulic Lifts
- Chapter 7: Work of Fluids
- Chapter 8: Bernoulli's Formula
- Chapter 9: Kinetic and Potential Energy of a Gas
- Chapter 10: Translational vs. Rotational Energy
- Chapter 11: Boltzman's constant
- Chapter 12: Ideal Gas Law
- Chapter 13: Fahrenheit, Celsius, and Kelvin Scales
- Chapter 14: Work Performed by Gases
- Chapter 15: Heat Energy
- Chapter 16: Specific Heat Capacity
- Chapter 17: Heat Conduction
- Chapter 18: Heat Convection
- Chapter 19: Infrared Radiation
- Chapter 20: Engine Efficiency

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Unit 7: Waves

- Chapter 1: Springs
- Chapter 2: Spring Constant
- Chapter 3: Potential Energy vs. Kinetic Energy
- Chapter 4: Harmonic Motion
- Chapter 5: Time Constant
- Chapter 6: Pendular Motion
- Chapter 7: Transverse Waves
- Chapter 8: Longitudinal Waves
- Chapter 9: Wave Velocity
- Chapter 10: Wave Frequency.
- Chapter 11: Sound Waves
- Chapter 12: Sound Intensity
- Chapter 13: Decibels
- Chapter 14: Human Hearing
- Chapter 15: Sound Intensity
- Chapter 16: Doppler Effect
- Chapter 17: Sonic Boom
- Chapter 18: Standing Waves and Antinodes
- Chapter 19: Harmonic Frequencies
- Chapter 20: Open vs. Closed Pipes

Unit 8: Light

- Chapter 1: Photons
- Chapter 2: Electromagnetic Energy
- Chapter 3: Refraction
- Chapter 4: Index of Refraction
- Chapter 5: Snell's law.
- Chapter 6: Color
- Chapter 7: Energy of a Photon
- Chapter 8: Infrared Light
- Chapter 9: Ultraviolet Light
- Chapter 10: Types of Electromagnetic Radiation
- Chapter 11: Light Refraction
- Chapter 12: Brewster's Angle
- Chapter 13: Rainbows
- Chapter 14: Mirages

Unit 8a: Light Reflection

- Chapter 1: Light Scattering
- Chapter 2: Ionization Energy
- Chapter 3: Electron Movement Between Atomic Shells
- Chapter 4: Rydberg Formula
- Chapter 5: Spectroscopy
- Chapter 6: Fraunhofer Lines
- Chapter 7: Max Planck

Unit 8a: Light Reflection (cont'd.)

- Chapter 8: Energy Quanta
- Chapter 9: James Maxwell
- Chapter 10: Louis de Broglie
- Chapter 11: Lasers
- Chapter 12: Polarization of Light
- Chapter 13: 3-Dimensional Vision

Unit 8b: Mirrors and Lenses

- Chapter 1: Virtual Images
- Chapter 2: Convex vs. Concave Mirrors
- Chapter 3: Principal Axis
- Chapter 4: Center of Curvature
- Chapter 5: Focal Point
- Chapter 6: Angle of Incidence
- Chapter 7: Angle of Reflection
- Chapter 8: Parabolic Mirrors.
- Chapter 9: Mirror Equation
- Chapter 10: Diopters
- Chapter 11: Combining Lenses
- Chapter 12: Diverging Lenses
- Chapter 13: Lens Maker's Equation
- Chapter 14: Constructive and Destructive Light
- Chapter 15: Ray Interference
- Chapter 16: Thomas Young

Unit 9: Electricity

- Chapter 1: Electrical Charges
- Chapter 2: Electrical Field
- Chapter 3: Electrical Field Strength
- Chapter 4: Permittivity
- Chapter 5: Electrical Force
- Chapter 6: Gravitation Force vs. Electrical Force
- Chapter 7: Force
- Chapter 8: Newton's Third Law
- Chapter 9: Robert Millikan
- Chapter 10: Electrical Force in a Nucleus
- Chapter 11: Electrical Force Vectors
- Chapter 12: Lightning
- Chapter 13: van der Graaf Generator
- Chapter 14: Electrical Flux
- Chapter 15: Electrical Field in Hollow Chamber
- Chapter 16: Chambers
- Chapter 17: Coaxial Cable
- Chapter 18: Voltage
- Chapter 19: Capacitor
- Chapter 20: Capacitance

Unit 9a: Current and Magnetism

- Chapter 1: Current
- Chapter 2: Resistance
- Chapter 3: Electrical Work
- Chapter 4: Electrical Power
- Chapter 5: Electrical Circuits in Series
- Chapter 6: Electrical Circuits in Parallel
- Chapter 7: Measuring Current, Voltage, Capacitance
- Chapter 8: Gustav Kirchoff
- Chapter 9: Electrical Force Between Electrical Fields
- Chapter 10: Magnetic fields Around a Moving Electrical Charge
- Chapter 11: Right-Hand Rule
- Chapter 12: Magnetic Forces Between Electrical Fields
- Chapter 13: Pole Strength
- Chapter 14: Webers
- Chapter 15: Magnetic Field Strength
- Chapter 16: Teslas
- Chapter 17: Calculating Magnetic Force Between Magnetic Fields
- Chapter 18: Solenoid
- Chapter 19: Magnetic Metals
- Chapter 20: Electromagnets

Unit 9b: Electricity and Magnetism

- Chapter 1: Galvanometer
- Chapter 2: Ammeter
- Chapter 3: Voltmeter
- Chapter 4: Electrical Motor
- Chapter 5: Michael Faraday: Electromotive
- Chapter 6: Force
- Chapter 7: Lenz' Law
- Chapter 8: Electrical Generator
- Chapter 9: Eddy Currents
- Chapter 10: Alternating Current
- Chapter 11: Back Electromotive Force
- Chapter 12: Transformer
- Chapter 13: Electrical Power Stations
- Chapter 14: Inductance
- Chapter 15: Impedance
- Chapter 16: Resonant Frequency

Unit 10: The Atom

- Chapter 1: Thomas Young's Slit Experiment
- Chapter 2: James Clerk Maxwell
- Chapter 3: Heinrich Hertz
- Chapter 4: Phillip Lenard
- Chapter 5: Photoelectric Effect
- Chapter 6: Albert Einstein
- Chapter 7: Work Energy
- Chapter 8: Max Planck
- Chapter 9: Electromagnetic Radiation: Wave vs. Particle
- Chapter 10: Planck's Constant
- Chapter 11: Speed of Light
- Chapter 12: Arthur Compton
- Chapter 13: Louis de Broglie
- Chapter 14: Werner Heisenberg
- Chapter 15: Electron Probability Clouds
- Chapter 16: Photon Absorption
- Chapter 17: Theodore Maiman: The Laser
- Chapter 18: Fluorescent Light Bulbs

Unit 10a: The Nucleus

- Chapter 1: Thomas Edison
- Chapter 2: Rectifying Alternating Current
- Chapter 3: Sir John Fleming: the Vacuum Tube
- Chapter 4: Lee De Forest: Amplifying Current
- Chapter 5: Transistors
- Chapter 6: Michaelson and Morley
- Chapter 7: Einstein's Theory of Special relativity
- Chapter 8: $E = mc^2$
- Chapter 9: Nuclear Decay
- Chapter 10: Nuclear Stability
- Chapter 11: Henri Becquerel: Radioactivity
- Chapter 12: Ernest Rutherford: Alpha Waves
Nuclear Fission
Nuclear Reactors
Nuclear Fusion