Cambridge IGCSE Science - Combined (0653) Syllabus Breakdown & Weekly Lesson Plan

Assessment Structure :

- **Core**: Papers 1 (Multiple Choice) + 3 (Theory) + 5 (Alternative to Practical)
- **Extended**: Papers 2 (Multiple Choice) + 4 (Theory) + 6 (Alternative to Practical)
- **AO1 Knowledge & Understanding**: ~50%
- **AO2 Handling Information & Problem-Solving**: ~30%
- **AO3 Experimental Skills**: ~20%

Topic Weightings (Three Sciences Approximately Equal)

Science Area	Weighting	Weeks Allocated
Physics (P1-P5)	~33%	5.5 weeks
Chemistry (C1-C12)	~33%	5.5 weeks
Biology (B1-B12)	~33%	5 weeks
Practical Skills & Revision	Integrated	2 weeks

Detailed 16-Week Lesson Plan

WEEK 1-2: PHYSICS - MOTION, FORCES & ENERGY (P1)

Week 1: Kinematics & Forces

- Day 1: Speed, velocity, acceleration, distance-time & speed-time graphs
- Day 2: Calculating gradients, area under graphs, motion equations
- Day 3: Forces, resultant forces, friction, air resistance, Newton's Laws
- Day 4: Past paper practice: Motion calculations (Papers 2/4)
- Day 5: **Practical**: Investigating motion using light gates/ticker tape
- Day 6: Past paper review: Graph interpretation errors

Week 2: Energy, Work & Power

- Day 1: Energy stores (kinetic, potential, chemical, nuclear, thermal)
- Day 2: Energy transfer, conservation of energy, Sankey diagrams
- Day 3: Work done, power calculations, energy resources

- Day 4: Past paper practice: Energy calculations and efficiency
- Day 5: **Practical**: Measuring energy efficiency of devices
- Day 6: Past paper review: Efficiency formula applications

WEEK 3-4: PHYSICS - THERMAL PHYSICS & WAVES (P2-P3)

Week 3: Thermal Physics

- Day 1: States of matter, kinetic particle theory, Brownian motion
- Day 2: Thermal expansion, evaporation, conduction, convection, radiation
- Day 3: Specific heat capacity, latent heat, pressure in gases
- Day 4: Past paper practice: Thermal energy transfer questions
- Day 5: **Practical**: Investigating insulation or specific heat capacity
- Day 6: Past paper review: Particle model explanations

Week 4: Waves

- Day 1: Wave properties, electromagnetic spectrum, applications
- Day 2: Light - reflection, refraction, total internal reflection, lenses
- Day 3: Sound waves, properties, ultrasound, speed of sound
- Day 4: Past paper practice: Wave calculations and ray diagrams
- Day 5: **Practical**: Investigating refraction or wave properties
- Day 6: Past paper review: EM spectrum applications

WEEK 5: PHYSICS - ELECTRICITY & SPACE (P4-P5)

Week 5: Electricity & Space Physics

- Day 1: Current, voltage, resistance, Ohm's Law, circuits
- Day 2: Series/parallel circuits, electrical safety, power
- Day 3: Solar System, stars, life cycle of stars, galaxies, Big Bang
- Day 4: Past paper practice: Electricity calculations & space questions
- Day 5: **Practical**: Investigating I-V characteristics
- Day 6: Past paper review: Circuit diagram errors

WEEK 6-8: CHEMISTRY - FUNDAMENTALS & STRUCTURE (C1-C4)

Week 6: Particulate Nature & Elements

- Day 1: States of matter, kinetic theory, diffusion, changes of state
- Day 2: Elements, compounds, mixtures, separation techniques
- Day 3: Atomic structure, isotopes, electron arrangement
- Day 4: Past paper practice: Particle theory & separation methods
- Day 5: **Practical**: Chromatography or simple distillation
- Day 6: Past paper review: Drawing particle diagrams

Week 7: Bonding & Structure

- Day 1: Ionic bonding, properties of ionic compounds
- Day 2: Covalent bonding, simple molecules, giant structures
- Day 3: Metallic bonding, alloys, structure-property relationships
- Day 4: Past paper practice: Bonding and structure questions
- Day 5: **Practical**: Investigating properties of compounds
- Day 6: Past paper review: Dot-and-cross diagram errors

Week 8: Stoichiometry & Electricity

- Day 1: Moles, molar mass, percentage composition, formulas
- Day 2: Electrolysis, products at electrodes, applications
- Day 3: Energy changes, exothermic/endothermic reactions
- Day 4: Past paper practice: Mole calculations & electrolysis
- Day 5: **Practical**: Electrolysis of aqueous solutions
- Day 6: Past paper review: Half-equation writing

WEEK 9-10: CHEMISTRY - REACTIONS & ORGANIC (C5-C8)

Week 9: Reaction Rates, Acids & Periodic Table

- Day 1: Factors affecting reaction rates, collision theory
- Day 2: Acids, bases, salts, neutralization, pH scale

- Day 3: Periodic table trends, groups, reactivity series
- Day 4: Past paper practice: Rate and acid questions
- Day 5: **Practical**: Investigating temperature on reaction rate
- Day 6: Past paper review: Rate graph interpretation

Week 10: Metals, Environment & Organic

- Day 1: Reactivity series, extraction of metals, corrosion
- Day 2: Air pollution, greenhouse effect, acid rain
- Day 3: Alkanes, alkenes, cracking, alcohols, polymers
- Day 4: Past paper practice: Metal extraction & organic chemistry
- Day 5: **Practical**: Testing for unsaturation or polymer properties
- Day 6: Past paper review: Organic reaction conditions

WEEK 11-12: BIOLOGY - CELLS & NUTRITION (B1-B4)

Week 11: Cells & Transport

- Day 1: Cell structure (plant & animal), organelles, functions
- Day 2: Diffusion, osmosis, active transport, surface area to volume ratio
- Day 3: Enzymes, factors affecting enzyme activity
- Day 4: Past paper practice: Cell structure & transport questions
- Day 5: **Practical**: Investigating osmosis or enzyme activity
- Day 6: Past paper review: Osmosis vs diffusion confusion

Week 12: Nutrition & Photosynthesis

- Day 1: Nutrients, balanced diet, digestive system
- Day 2: Photosynthesis, leaf structure, factors affecting rate
- Day 3: Digestive enzymes, absorption, transport in plants
- Day 4: Past paper practice: Photosynthesis and nutrition
- Day 5: **Practical**: Testing for starch or investigating photosynthesis
- Day 6: Past paper review: Photosynthesis equation errors

WEEK 13-14: BIOLOGY - TRANSPORT, RESPIRATION & COORDINATION (B5-B8)

Week 13: Transport & Respiration

- Day 1: Circulatory system, heart structure, blood vessels
- Day 2: Respiration (aerobic & anaerobic), gas exchange
- Day 3: Breathing system, breathing vs respiration
- Day 4: Past paper practice: Transport and respiration questions
- Day 5: **Practical**: Investigating respiration in yeast or peas
- Day 6: Past paper review: Heart structure identification

Week 14: Coordination, Homeostasis & Reproduction

- Day 1: Nervous system, reflex arc, hormones
- Day 2: Homeostasis (temperature, blood glucose), feedback mechanisms
- Day 3: Reproduction (asexual & sexual), reproductive systems
- Day 4: Past paper practice: Coordination and homeostasis
- Day 5: **Practical**: Investigating reaction time or osmoregulation
- Day 6: Past paper review: Hormone vs nerve confusion

WEEK 15-16: PRACTICAL SKILLS & EXAM PRACTICE

Week 15: Mock Exams & Practical Skills

- Day 1: **Full Paper 2 mock** (Multiple Choice, 40 min) + review
- Day 2: **Full Paper 4 mock** (Theory, 1h 15m) + extended answer marking
- Day 3: **Full Paper 6 mock** (Alternative to Practical, 1h) + skills review
- Day 4: Error analysis: Identify weak science areas
- Day 5: Targeted revision: Weakest 3 topics
- Day 6: Command words workshop (state, describe, explain, calculate)

Week 16: Final Preparation

- Day 1: **Final Full Mock** (all papers) under exam conditions
- Day 2: Detailed review of mock, common misconceptions
- Day 3: Time management strategies for each paper

- Day 4: Practical skills checklist: Planning, recording, evaluating
- Day 5: Light review, confidence building
- Day 6: Exam day preparation, Q&A

Past Paper Integration Strategy

1. **Topic-based practice**: 3-5 questions after each sub-topic from topic-wise compilations
2. **Weekly mixed practice**: Every week includes one full paper section (Paper 2/4/6)
3. **Practical skills**: Every practical lesson includes past Paper 5/6 questions on planning/evaluating
4. **Command words**: Focus on "describe", "explain", "calculate", "state" differences
5. **Cumulative testing**: Every 2 weeks, mixed questions from all sciences covered

Key Resources:

- **Syllabus**: 0653 syllabus for 2025-2027
- **Past papers**: 2019-2024 series from Cambridge International
- **Practical workbook**: Cambridge Combined Science Practical Skills
- **Calculator**: Scientific calculator required for Papers 3/4

Exam Tips:

- **Paper 6 skills**: Master describing experimental methods, identifying variables, evaluating procedures
- **Three sciences**: Balance revision time equally - each is worth ~33%
- **Mathematical skills**: Practice mole calculations, energy calculations, and graph analysis
- **Common pitfalls**: Confusing respiration with breathing, mixing up reaction types, misreading graph scales