50-Day IOQM Preparation Schedule

Start Date: July 18, 2025 End Date: September 5, 2025

This schedule is designed to provide a structured approach to your IOQM preparation. It covers the four main pillars: Number Theory, Algebra, Geometry, and Combinatorics, with ample time for practice, revision, and mock tests. Remember to adjust it based on your strengths and weaknesses.

Video link: https://www.youtube.com/@axiomatom

Phase 1: Foundation Building (Days 1-15) - Number Theory & Basic Algebra

Goal: Strengthen fundamental concepts and problem-solving techniques in Number Theory and Algebra.

- **Day 1 (July 18): Divisibility & Prime Numbers**
    - Concepts: Divisibility rules, prime and composite numbers, unique factorization theorem.
    - Practice: Problems involving divisors, number of divisors, sum of divisors.
- **Day 2 (July 19): GCD & LCM**
    - Concepts: Euclidean Algorithm, properties of GCD and LCM.
    - Practice: Problems involving GCD/LCM, applications in number theory.
- **Day 3 (July 20): Modular Arithmetic - Introduction**
    - Concepts: Congruence, basic properties of modular arithmetic.
    - Practice: Simple congruence equations.
- **Day 4 (July 21): Modular Arithmetic - Advanced**
    - Concepts: Fermat's Little Theorem, Euler's Totient Theorem, Chinese Remainder Theorem (basic).
    - Practice: Problems applying these theorems.
- **Day 5 (July 22): Diophantine Equations (Linear)**
    - Concepts: Solving $ax + by = c$ equations.
    - Practice: Finding integer solutions.
- **Day 6 (July 23): Number Theory Review & Problem Solving**
    - Review all Number Theory topics covered.

- Solve mixed problems from previous IOQM/RMO papers related to Number Theory.

- **Day 7 (July 24): Polynomials - Basics**
  - Concepts: Polynomial operations, roots, factor theorem, remainder theorem.
  - Practice: Simple polynomial problems.
- **Day 8 (July 25): Polynomials - Vieta's Formulas**
  - Concepts: Relation between roots and coefficients.
  - Practice: Problems involving sums/products of roots.
- **Day 9 (July 26): Inequalities - AM-GM Inequality**
  - Concepts: Arithmetic Mean - Geometric Mean inequality.
  - Practice: Problems applying AM-GM.
- **Day 10 (July 27): Inequalities - Cauchy-Schwarz & Rearrangement**
  - Concepts: Cauchy-Schwarz inequality, rearrangement inequality (basic understanding).
  - Practice: Problems applying these inequalities.
- **Day 11 (July 28): Quadratic Equations & Expressions**
  - Concepts: Discriminant, nature of roots, properties of quadratic functions.
  - Practice: Problems involving quadratic equations and expressions.
- **Day 12 (July 29): Sequences & Series - AP, GP, HP**
  - Concepts: Arithmetic Progression, Geometric Progression, Harmonic Progression.
  - Practice: Sums, general terms, properties.
- **Day 13 (July 30): Functional Equations (Introduction)**
  - Concepts: Basic techniques for solving simple functional equations.
  - Practice: Simple functional equation problems.
- **Day 14 (July 31): Algebra Review & Problem Solving**
  - Review all Algebra topics covered.

- Solve mixed problems from previous IOQM/RMO papers related to Algebra.

- **Day 15 (August 1): Mixed Bag Problem Solving (Phase 1)**
  - Solve a collection of problems combining Number Theory and Algebra. Focus on identifying the correct approach.

Phase 2: Deep Dive (Days 16-30) - Geometry & Combinatorics

Goal: Master geometric properties and combinatorial counting techniques.

- **Day 16 (August 2): Triangles - Basic Properties**
  - Concepts: Angles, sides, area, special triangles (equilateral, isosceles, right-angled).
  - Practice: Basic triangle problems.
- **Day 17 (August 3): Triangles - Congruence & Similarity**
  - Concepts: Criteria for congruence and similarity, applications.
  - Practice: Problems involving similar triangles and their properties.
- **Day 18 (August 4): Circles - Chords, Arcs, Angles**
  - Concepts: Properties of chords, arcs, central angles, inscribed angles.
  - Practice: Problems related to angles in circles.
- **Day 19 (August 5): Circles - Tangents & Secants**
  - Concepts: Properties of tangents, secants, power of a point theorem.
  - Practice: Problems involving tangents and secants.
- **Day 20 (August 6): Quadrilaterals & Polygons**
  - Concepts: Properties of parallelograms, rectangles, squares, rhombuses, trapezoids, general polygons.
  - Practice: Area and angle problems for quadrilaterals.
- **Day 21 (August 7): Co-ordinate Geometry (Basic)**
  - Concepts: Distance formula, section formula, area of triangle, straight lines.
  - Practice: Basic problems in coordinate geometry.
- **Day 22 (August 8): Geometry Review & Problem Solving**

- Review all Geometry topics covered.
- Solve mixed problems from previous IOQM/RMO papers related to Geometry.

- **Day 23 (August 9): Permutations & Combinations - Basics**
  - Concepts: Fundamental principle of counting, permutations (arrangements), combinations (selections).
  - Practice: Simple counting problems.
- **Day 24 (August 10): Permutations & Combinations - Advanced**
  - Concepts: Circular permutations, permutations with repetition, combinations with repetition.
  - Practice: More complex counting problems.
- **Day 25 (August 11): Principle of Inclusion-Exclusion (PIE)**
  - Concepts: Understanding and applying PIE for counting.
  - Practice: Problems using PIE.
- **Day 26 (August 12): Pigeonhole Principle (PHP)**
  - Concepts: Basic and generalized PHP.
  - Practice: Problems applying PHP.
- **Day 27 (August 13): Probability (Basic Combinatorial Probability)**
  - Concepts: Definition of probability, events, sample space, conditional probability (basic).
  - Practice: Problems involving combinatorial probability.
- **Day 28 (August 14): Combinatorics Review & Problem Solving**
  - Review all Combinatorics topics covered.
  - Solve mixed problems from previous IOQM/RMO papers related to Combinatorics.
- **Day 29 (August 15): Mixed Bag Problem Solving (Phase 2)**
  - Solve a collection of problems combining Geometry and Combinatorics.
- **Day 30 (August 16): Mid-Preparation Mock Test**
  - Take a full-length IOQM mock test.

- Analyze your performance, identify weak areas.

Phase 3: Advanced Topics & Problem Solving (Days 31-40)

Goal: Tackle more challenging problems, explore advanced concepts, and integrate knowledge across topics.

- **Day 31 (August 17): Advanced Number Theory Problems**
  - Focus on problems requiring deeper understanding of modular arithmetic, number theoretic functions, or properties of integers.
  - Practice: IOQM/RMO level problems.
- **Day 32 (August 18): Advanced Algebra Problems**
  - Focus on problems involving advanced inequalities, polynomial equations, or functional equations.
  - Practice: IOQM/RMO level problems.
- **Day 33 (August 19): Advanced Geometry Problems (Part 1)**
  - Concepts: Ceva's Theorem, Menelaus' Theorem, Simson Line (basic understanding and application).
  - Practice: Problems applying these theorems.
- **Day 34 (August 20): Advanced Geometry Problems (Part 2)**
  - Concepts: Radical axis, inversion (basic idea), properties of cyclic quadrilaterals.
  - Practice: Problems involving these concepts.
- **Day 35 (August 21): Advanced Combinatorics Problems**
  - Focus on problems requiring creative counting, advanced PIE applications, or generating functions (basic).
  - Practice: IOQM/RMO level problems.
- **Day 36 (August 22): Problem Solving Session - Mixed Topics**
  - Solve a diverse set of problems, focusing on problem-solving strategies and thinking outside the box.
- **Day 37 (August 23): Proof Techniques & Logic**
  - Concepts: Direct proof, proof by contradiction, proof by induction.

    - Practice: Understand how to construct proofs for mathematical statements.
- **Day 38 (August 24): Olympiad Problem Solving Strategies**
    - Discussion/Practice: How to approach unseen problems, common pitfalls, using auxiliary lines in geometry, casework in combinatorics.
- **Day 39 (August 25): Review of Weak Areas**
    - Based on your mock test and practice, dedicate this day to revisiting topics where you struggle the most.
- **Day 40 (August 26): Another Mock Test**
    - Take another full-length IOQM mock test.
    - Analyze results and compare with the previous mock test.

Phase 4: Revision & Mock Tests (Days 41-50)

Goal: Consolidate knowledge, refine time management, and build confidence for the exam.

- **Day 41 (August 27): Full Syllabus Revision - Number Theory & Algebra**
    - Quick review of all formulas, theorems, and key concepts.
    - Solve a few representative problems from each topic.
- **Day 42 (August 28): Full Syllabus Revision - Geometry & Combinatorics**
    - Quick review of all formulas, theorems, and key concepts.
    - Solve a few representative problems from each topic.
- **Day 43 (August 29): Mock Test 3**
    - Take a full-length IOQM mock test under exam conditions.
    - Focus on time management and accuracy.
- **Day 44 (August 30): Mock Test Analysis & Error Correction**
    - Thoroughly analyze your mistakes from Mock Test 3.
    - Understand *why* you made errors and how to avoid them.
- **Day 45 (August 31): Targeted Practice - Challenging Problems**
    - Work on a selection of the most challenging problems you've encountered or identified as difficult.

- **Day 46 (September 1): Quick Revision of Key Formulas & Theorems**
    - Create flashcards or a cheat sheet of important formulas, identities, and theorems.
- **Day 47 (September 2): Mock Test 4**
    - Take your final full-length IOQM mock test.
    - Simulate exam conditions as closely as possible.
- **Day 48 (September 3): Final Mock Test Analysis & Strategy Refinement**
    - Review Mock Test 4.
    - Refine your exam strategy: order of attempting questions, time allocation per question.
- **Day 49 (September 4): Light Revision & Mental Preparation**
    - Avoid learning new topics. Lightly revise key concepts.
    - Focus on staying calm and confident. Get good rest.
- **Day 50 (September 5): Rest Day / Light Activity**
    - Do not study intensely. Relax, clear your mind, and prepare for the exam day.

General Tips for IOQM Preparation:

1. **Understand Concepts Deeply:** Don't just memorize formulas. Understand the derivations and the underlying logic.
2. **Practice, Practice, Practice:** Solve a wide variety of problems. The more you practice, the better you become at recognizing patterns and applying concepts.
3. **Solve Previous Year Papers:** This is crucial. It gives you an idea of the exam pattern, difficulty level, and types of questions asked.
4. **Maintain a Problem Log:** Keep a notebook of challenging problems you solved, especially those where you learned a new technique.
5. **Review Regularly:** Consistent revision helps solidify your understanding and recall.
6. **Analyze Mistakes:** Every mistake is an opportunity to learn. Understand why you made an error and how to avoid it next time.
7. **Time Management:** Practice solving problems under timed conditions, especially during mock tests.

8. **Stay Healthy:** Ensure you get enough sleep, eat well, and take short breaks to avoid burnout.
9. **Seek Help:** If you're stuck on a concept or problem, don't hesitate to ask teachers, mentors, or peers for help.
10. **Stay Positive:** Believe in yourself and your abilities. Consistency and a positive attitude are key to success.

Good luck with your IOQM preparation!

120-Day Physics Olympiad Preparation Schedule

Start Date: July 18, 2025

End Date: November 14, 2025

This 120-day schedule is meticulously crafted to guide aspiring Physics Olympiad participants through a comprehensive and systematic preparation journey. It balances theoretical understanding with extensive problem-solving, focusing on the core areas of Physics typically covered in Olympiads. The plan emphasizes building a strong foundation, delving into advanced topics, and refining problem-solving strategies through regular practice and mock tests.

Phase 1: Mechanics & Properties of Matter (Days 1-40) - Foundation & Intermediate

Goal: Build a strong conceptual and problem-solving base in Mechanics and understand the fundamental properties of matter.

- **Week 1: Kinematics & Dynamics**
    - **Day 1 (July 18): Kinematics in 1D:** Displacement, velocity, acceleration, equations of motion.
    - **Day 2 (July 19): Kinematics in 2D:** Projectile motion, relative motion.
    - **Day 3 (July 20): Newton's Laws of Motion:** Inertia, force, momentum, action-reaction.
    - **Day 4 (July 21): Friction & Circular Motion:** Static and kinetic friction, centripetal force.
    - **Day 5 (July 22): Work, Energy, Power:** Work-energy theorem, conservative/non-conservative forces, potential and kinetic energy, conservation of mechanical energy.
    - **Day 6 (July 23): Impulse & Momentum:** Conservation of momentum, collisions (elastic/inelastic).
    - **Day 7 (July 24): Mechanics Problem Solving (Basic):** Mixed problems on Kinematics and Dynamics.
- **Week 2: Rotational Motion & Gravitation**
    - **Day 8 (July 25): Rotational Kinematics:** Angular displacement, velocity, acceleration, equations.
    - **Day 9 (July 26): Torque & Angular Momentum:** Moment of inertia, conservation of angular momentum.
    - **Day 10 (July 27): Rolling Motion:** Pure rolling, rolling with slipping.

- **Day 11 (July 28): Gravitation:** Newton's Law of Gravitation, gravitational field, potential energy.
- **Day 12 (July 29): Orbital Mechanics:** Kepler's Laws, satellite motion, escape velocity.
- **Day 13 (July 30): Simple Harmonic Motion (SHM):** Basic concepts, equations, energy in SHM.
- **Day 14 (July 31): Mechanics Problem Solving (Intermediate):** Mixed problems on Rotational Motion, Gravitation, and SHM.

- **Week 3: Properties of Matter - Solids & Fluids**
  - **Day 15 (August 1): Elasticity:** Stress, strain, Young's modulus, bulk modulus, shear modulus.
  - **Day 16 (August 2): Fluid Statics:** Pressure, Pascal's Law, Archimedes' Principle, buoyancy.
  - **Day 17 (August 3): Fluid Dynamics:** Bernoulli's Principle, continuity equation, viscosity, Poiseuille's formula (conceptual).
  - **Day 18 (August 4): Surface Tension:** Surface energy, capillary action.
  - **Day 19 (August 5): Thermal Expansion & Calorimetry:** Linear, area, volume expansion, specific heat, latent heat.
  - **Day 20 (August 6): Heat Transfer:** Conduction, convection, radiation (Stefan-Boltzmann Law, Wien's Law).
  - **Day 21 (August 7): Properties of Matter Problem Solving:** Mixed problems.
- **Week 4: Thermodynamics**
  - **Day 22 (August 8): Zeroth & First Law of Thermodynamics:** Internal energy, work, heat, specific heats of gases.
  - **Day 23 (August 9): Thermodynamic Processes:** Isothermal, adiabatic, isobaric, isochoric processes.
  - **Day 24 (August 10): Second Law of Thermodynamics:** Entropy (conceptual), heat engines, refrigerators, Carnot cycle.
  - **Day 25 (August 11): Kinetic Theory of Gases:** Ideal gas equation, molecular speeds, degrees of freedom.
  - **Day 26 (August 12): Sound Waves:** Wave characteristics, speed of sound, Doppler effect.

- **Day 27 (August 13): Superposition of Waves:** Interference, beats, standing waves, organ pipes, strings.
- **Day 28 (August 14): Thermodynamics & Waves Problem Solving.**

- **Day 29 (August 15): Comprehensive Mechanics & Properties of Matter Review.**
- **Day 30 (August 16): Mock Test 1 (Mechanics & Properties of Matter).**

Phase 2: Electromagnetism & Optics (Days 31-80) - Core & Advanced

Goal: Develop a strong understanding of Electromagnetism and Optics, including complex circuit analysis and wave phenomena.

- **Week 5: Electrostatics**
  - **Day 31 (August 17): Coulomb's Law & Electric Field:** Point charges, continuous charge distributions (conceptual for simple cases).
  - **Day 32 (August 18): Electric Potential & Potential Energy:** Equipotential surfaces.
  - **Day 33 (August 19): Gauss's Law:** Applications for symmetric charge distributions.
  - **Day 34 (August 20): Capacitance:** Parallel plate capacitor, combinations of capacitors, dielectrics.
  - **Day 35 (August 21): Electrostatics Problem Solving.**
- **Week 6: Current Electricity**
  - **Day 36 (August 22): Electric Current & Resistance:** Ohm's Law, resistivity, temperature dependence.
  - **Day 37 (August 23): Series & Parallel Combinations:** Kirchhoff's Laws.
  - **Day 38 (August 24): Electrical Power & Energy:** Heating effect of current.
  - **Day 39 (August 25): Measuring Instruments:** Galvanometer, ammeter, voltmeter, potentiometer, Wheatstone bridge.
  - **Day 40 (August 26): Current Electricity Problem Solving.**
- **Week 7: Magnetism**
  - **Day 41 (August 27): Magnetic Field & Force:** Force on a moving charge, force on a current-carrying conductor.
  - **Day 42 (August 28): Biot-Savart Law & Ampere's Law:** Magnetic field due to various current configurations (straight wire, loop, solenoid).

- **Day 43 (August 29): Torque on a Current Loop:** Magnetic dipole moment.
- **Day 44 (August 30): Earth's Magnetism & Magnetic Properties of Materials (Conceptual).**
- **Day 45 (August 31): Magnetism Problem Solving.**

- **Week 8: Electromagnetic Induction & AC**
  - **Day 46 (September 1): Faraday's Law & Lenz's Law:** Motional EMF.
  - **Day 47 (September 2): Self-Inductance & Mutual Inductance:** LC oscillations (conceptual).
  - **Day 48 (September 3): Alternating Current (AC):** RMS values, AC circuits with R, L, C.
  - **Day 49 (September 4): Resonance & Power in AC Circuits:** Transformers.
  - **Day 50 (September 5): Electromagnetic Waves (Conceptual):** Properties, spectrum.
  - **Day 51 (September 6): EMI & AC Problem Solving.**
- **Week 9: Ray Optics**
  - **Day 52 (September 7): Reflection:** Plane mirrors, spherical mirrors, mirror formula, magnification.
  - **Day 53 (September 8): Refraction:** Snell's Law, total internal reflection, critical angle.
  - **Day 54 (September 9): Lenses:** Thin lens formula, lens maker's formula, combinations of lenses.
  - **Day 55 (September 10): Optical Instruments:** Human eye, microscope, telescope.
  - **Day 56 (September 11): Ray Optics Problem Solving.**
- **Week 10: Wave Optics**
  - **Day 57 (September 12): Huygens' Principle:** Reflection and refraction using wave theory.
  - **Day 58 (September 13): Interference:** Young's Double Slit Experiment, conditions for sustained interference.
  - **Day 59 (September 14): Diffraction:** Single slit diffraction (qualitative), diffraction grating (conceptual).

- **Day 60 (September 15): Polarization:** Malus's Law, Brewster's Law (conceptual).
- **Day 61 (September 16): Wave Optics Problem Solving.**

- **Day 62 (September 17): Electromagnetism & Optics Review.**
- **Day 63 (September 18): Mock Test 2 (Electromagnetism & Optics).**
- **Day 64 (September 19): Mock Test 2 Analysis & Weak Area Identification.**
- **Day 65 (September 20): Targeted Practice on Weak Areas from Mock 2.**

Phase 3: Modern Physics & Advanced Topics (Days 81-105) - Olympiad Level

Goal: Cover advanced topics, develop a deeper conceptual understanding, and refine problem-solving skills for complex, multi-concept problems.

- **Week 11: Modern Physics - Dual Nature & Atoms**
  - **Day 66 (September 21): Dual Nature of Radiation & Matter:** Photoelectric effect, de Broglie wavelength.
  - **Day 67 (September 22): Atomic Structure:** Bohr's model, hydrogen spectrum, X-rays.
  - **Day 68 (September 23): Nuclei:** Composition, size, mass defect, binding energy.
  - **Day 69 (September 24): Radioactivity:** Alpha, beta, gamma decay, half-life, nuclear reactions.
  - **Day 70 (September 25): Modern Physics Problem Solving.**
- **Week 12: Semiconductor Electronics & Communication Systems**
  - **Day 71 (September 26): Semiconductors:** Intrinsic & extrinsic, p-n junction, forward/reverse bias.
  - **Day 72 (September 27): Diodes & Rectifiers:** Zener diode (conceptual).
  - **Day 73 (September 28): Transistors (Conceptual):** Basic working, applications (switch/amplifier).
  - **Day 74 (September 29): Communication Systems (Conceptual):** Modulation, demodulation, bandwidth.
  - **Day 75 (September 30): Electronics & Communication Problem Solving.**
- **Week 13: Experimental Physics & Data Analysis**

- **Day 76 (October 1): Error Analysis:** Types of errors, propagation of errors, significant figures.
- **Day 77 (October 2): Graphing & Data Interpretation:** Linearization of data, slope, intercept.
- **Day 78 (October 3): Common Experimental Setups:** Vernier caliper, screw gauge, spectrometer, potentiometer, meter bridge (revisit principles).
- **Day 79 (October 4): Designing Experiments (Conceptual):** Understanding variables, controls, procedure.
- **Day 80 (October 5): Experimental Physics Problem Solving.**

- **Week 14: Special Topics & Advanced Problem Solving**
  - **Day 81 (October 6): Fluid Mechanics (Advanced):** Viscous drag, Stokes' Law, Reynolds number (conceptual).
  - **Day 82 (October 7): Elasticity (Advanced):** Torsion, bending of beams (conceptual).
  - **Day 83 (October 8): Advanced Optics (Conceptual):** Dispersion, optical fibers.
  - **Day 84 (October 9): Review of Most Challenging Concepts.**
  - **Day 85 (October 10): Advanced Mixed Problem Solving (Olympiad Level).**
- **Day 86 (October 11): Mock Test 3 (Full Syllabus).**
- **Day 87 (October 12): Mock Test 3 Analysis & Detailed Error Review.**
- **Day 88 (October 13): Targeted Practice on Persistent Weaknesses.**
- **Day 89 (October 14): Revisit Key Derivations & Proofs.**
- **Day 90 (October 15): Review of Olympiad Problem-Solving Strategies.**

Phase 4: Grand Revision & Final Mock Tests (Days 106-120) - Exam Readiness

Goal: Consolidate all knowledge, refine time management, and build peak confidence for the actual examination.

- **Week 15: Intensive Revision - Part 1**
  - **Day 91 (October 16): Mechanics & Properties of Matter Quick Revision:** Formulas, key concepts, common tricky points.

- **Day 92 (October 17): Mechanics & Properties of Matter Problem Solving Sprint:** Solve 10-15 high-quality problems quickly.
- **Day 93 (October 18): Electromagnetism Quick Revision:** Formulas, circuit analysis techniques, magnetic field rules.
- **Day 94 (October 19): Electromagnetism Problem Solving Sprint:** Solve 10-15 high-quality problems quickly.
- **Day 95 (October 20): Optics Quick Revision:** Ray diagrams, lens/mirror formulas, wave phenomena conditions.
- **Day 96 (October 21): Optics Problem Solving Sprint:** Solve 10-15 high-quality problems quickly.
- **Day 97 (October 22): Modern Physics & Electronics Quick Revision:** Key principles, conceptual understanding.

- **Week 16: Intensive Revision - Part 2 & Final Mocks**
  - **Day 98 (October 23): Modern Physics & Electronics Problem Solving Sprint:** Solve 10-15 high-quality problems quickly.
  - **Day 99 (October 24): Full Syllabus Formula & Concept Recall:** Rapid fire revision of all formulas and definitions.
  - **Day 100 (October 25): Mock Test 4 (Full Syllabus - High Difficulty).**
  - **Day 101 (October 26): Mock Test 4 Detailed Analysis & Strategic Adjustments:** Focus on time management, question selection, and avoiding silly mistakes.
  - **Day 102 (October 27): Targeted Practice on Remaining Critical Weaknesses.**
  - **Day 103 (October 28): Review of Previous Olympiad Papers (Last 2-3 years):** Identify common themes and question styles.
  - **Day 104 (October 29): Light Revision & Mental Preparation:** Avoid new topics. Focus on confidence and relaxation.
  - **Day 105 (October 30): Rest Day:** Absolutely no new study. Get good sleep, eat well, and prepare for the exam day.
  - **Day 106 (October 31): Exam Day! (Hypothetical)**

General Tips for Physics Olympiad Preparation:

1. **Conceptual Clarity is Paramount:** Physics Olympiads test your understanding of principles, not just formula application. Focus on why things happen.

2. **Problem Solving is the Core:** The majority of your time should be spent solving problems. Start with easier ones and gradually move to Olympiad-level challenges.
3. **Understand Derivations:** Knowing how formulas are derived helps in understanding their limitations and applying them correctly in complex scenarios.
4. **Visualize Physics:** Draw diagrams for every problem. This helps in breaking down complex situations and identifying relevant forces, fields, or rays.
5. **Master Mathematics:** A strong foundation in algebra, trigonometry, and calculus (basic differentiation/integration) is essential as Physics problems often involve mathematical manipulation.
6. **Analyze Solutions Deeply:** Don't just check if your answer is correct. Understand the thought process behind the official solution, especially for problems you struggled with.
7. **Maintain a Formula & Concept Log:** Keep a concise notebook of all important formulas, theorems, and tricky concepts.
8. **Simulate Exam Conditions:** During mock tests, practice under strict time limits and without distractions.
9. **Review Regularly:** Physics concepts build upon each other. Regular revision prevents forgetting earlier topics.
10. **Stay Curious & Persistent:** Physics can be challenging, but a curious mind and persistence in overcoming difficulties are key to success.
11. **Seek Mentorship:** If possible, find a mentor or join a study group to discuss problems and clarify doubts.

Good luck with your Physics Olympiad preparation!

120-Day Junior Science Olympiad Preparation Schedule

Start Date: July 18, 2025 End Date: November 14, 2025

This 120-day schedule is meticulously designed to guide aspiring Junior Science Olympiad (JSO) participants through a comprehensive and systematic preparation journey. It balances theoretical understanding with extensive problem-solving, covering Physics, Chemistry, Biology, and Mathematics, which are the core subjects for the JSO. The plan emphasizes building a strong foundation, delving into advanced topics, and refining exam strategies through regular mock tests and revision.

Phase 1: Foundation Building (Days 1-30) - Core Concepts & Basics

Goal: Establish a solid understanding of fundamental concepts across all four subjects. Focus on clarity and basic problem-solving.

- **Week 1: Physics Fundamentals**
    - **Day 1 (July 18): Mechanics - Motion & Forces:** Distance, displacement, speed, velocity, acceleration, Newton's Laws of Motion, friction.
    - **Day 2 (July 19): Mechanics - Motion & Forces:** Distance, displacement, speed, velocity, acceleration, Newton's Laws of Motion, friction.
    - **Day 3 (July 20): Mechanics - Work, Energy & Power:** Work-energy theorem, potential and kinetic energy, conservation of energy, power.
    - **Day 4 (July 21): Mechanics - Work, Energy & Power:** Work-energy theorem, potential and kinetic energy, conservation of energy, power.
    - **Day 5 (July 22): Mechanics - Gravitation & Simple Machines:** Universal Law of Gravitation, acceleration due to gravity, levers, pulleys, inclined planes.
    - **Day 6 (July 23): Mechanics - Gravitation & Simple Machines:** Universal Law of Gravitation, acceleration due to gravity, levers, pulleys, inclined planes.
    - **Day 7 (July 24): Physics Review & Basic Problems.**
- **Week 2: Chemistry Fundamentals**
    - **Day 8 (July 25): Matter & Its States:** Classification of matter, physical and chemical changes, states of matter, interconversion.
    - **Day 9 (July 26): Matter & Its States:** Classification of matter, physical and chemical changes, states of matter, interconversion.

- **Day 10 (July 27): Atomic Structure:** Dalton's, Thomson's, Rutherford's, Bohr's models, subatomic particles, isotopes, isobars.
- **Day 11 (July 28): Atomic Structure:** Dalton's, Thomson's, Rutherford's, Bohr's models, subatomic particles, isotopes, isobars.
- **Day 12 (July 29): Chemical Bonding & Reactions:** Types of bonds (ionic, covalent), balancing chemical equations, types of reactions.
- **Day 13 (July 30): Chemical Bonding & Reactions:** Types of bonds (ionic, covalent), balancing chemical equations, types of reactions.
- **Day 14 (July 31): Chemistry Review & Basic Problems.**

- **Week 3: Biology Fundamentals**
  - **Day 15 (August 1): Cell - The Unit of Life:** Plant and animal cells, cell organelles, prokaryotic vs. eukaryotic cells.
  - **Day 16 (August 2): Cell - The Unit of Life:** Plant and animal cells, cell organelles, prokaryotic vs. eukaryotic cells.
  - **Day 17 (August 3): Tissues:** Plant tissues (meristematic, permanent), animal tissues (epithelial, connective, muscular, nervous).
  - **Day 18 (August 4): Tissues:** Plant tissues (meristematic, permanent), animal tissues (epithelial, connective, muscular, nervous).
  - **Day 19 (August 5): Diversity in Living Organisms:** Classification (Whittaker's 5 Kingdom), basic characteristics of kingdoms.
  - **Day 20 (August 6): Diversity in Living Organisms:** Classification (Whittaker's 5 Kingdom), basic characteristics of kingdoms.
  - **Day 21 (August 7): Biology Review & Basic Problems.**
- **Week 4: Mathematics Fundamentals**
  - **Day 22 (August 8): Number Systems & Algebra Basics:** Real numbers, rational/irrational, polynomials, factorization, linear equations.
  - **Day 23 (August 9): Number Systems & Algebra Basics:** Real numbers, rational/irrational, polynomials, factorization, linear equations.
  - **Day 24 (August 10): Geometry Basics:** Lines, angles, triangles (properties, congruence, similarity), quadrilaterals.
  - **Day 25 (August 11): Geometry Basics:** Lines, angles, triangles (properties, congruence, similarity), quadrilaterals.

- **Day 26 (August 12): Mensuration & Data Handling:** Area/perimeter of 2D shapes, volume/surface area of 3D shapes, mean, median, mode, probability (basic).
- **Day 27 (August 13): Mensuration & Data Handling:** Area/perimeter of 2D shapes, volume/surface area of 3D shapes, mean, median, mode, probability (basic).
- **Day 28 (August 14): Math Review & Basic Problems.**

- **Day 29 (August 15): Integrated Problem Solving (Phase 1):** Solve mixed problems covering all subjects from basic levels. Focus on understanding question types.
- **Day 30 (August 16): Integrated Problem Solving (Phase 1):** Solve mixed problems covering all subjects from basic levels. Focus on understanding question types.

Phase 2: Deep Dive & Problem Solving (Days 31-75) - Intermediate Concepts & Applications

Goal: Strengthen problem-solving skills, delve deeper into subject-specific topics, and understand interdisciplinary connections.

- **Week 5-6: Physics - Heat, Light & Sound**
  - **Day 31 (August 17): Heat:** Temperature, heat transfer (conduction, convection, radiation), specific heat capacity, latent heat.
  - **Day 32 (August 18): Heat:** Temperature, heat transfer (conduction, convection, radiation), specific heat capacity, latent heat.
  - **Day 33 (August 19): Light:** Reflection, refraction, lenses, mirrors, human eye.
  - **Day 34 (August 20): Light:** Reflection, refraction, lenses, mirrors, human eye.
  - **Day 35 (August 21): Sound:** Production, propagation, characteristics, echo, ultrasound.
  - **Day 36 (August 22): Sound:** Production, propagation, characteristics, echo, ultrasound.
  - **Day 37 (August 23): Electricity & Magnetism (Basics):** Current, voltage, resistance, Ohm's Law, circuits, magnetic effects of current.
  - **Day 38 (August 24): Electricity & Magnetism (Basics):** Current, voltage, resistance, Ohm's Law, circuits, magnetic effects of current.

- **Day 39 (August 25): Physics Problem Solving:** Focus on numerical problems and conceptual questions.
- **Day 40 (August 26): Physics Problem Solving:** Focus on numerical problems and conceptual questions.
- **Day 41 (August 27): Physics Problem Solving:** Focus on numerical problems and conceptual questions.
- **Day 42 (August 28): Physics Problem Solving:** Focus on numerical problems and conceptual questions.

- **Week 7-8: Chemistry - Chemical Reactions & Periodic Table**
  - **Day 43 (August 29): Acids, Bases & Salts:** Properties, pH scale, neutralization.
  - **Day 44 (August 30): Acids, Bases & Salts:** Properties, pH scale, neutralization.
  - **Day 45 (August 31): Metals & Non-metals:** Physical and chemical properties, reactivity series, extraction (basic).
  - **Day 46 (September 1): Metals & Non-metals:** Physical and chemical properties, reactivity series, extraction (basic).
  - **Day 47 (September 2): Carbon & Its Compounds:** Allotropes of carbon, hydrocarbons (basic nomenclature), functional groups (basic).
  - **Day 48 (September 3): Carbon & Its Compounds:** Allotropes of carbon, hydrocarbons (basic nomenclature), functional groups (basic).
  - **Day 49 (September 4): Periodic Classification of Elements:** Mendeleev's and Modern Periodic Table, trends in properties.
  - **Day 50 (September 5): Periodic Classification of Elements:** Mendeleev's and Modern Periodic Table, trends in properties.
  - **Day 51 (September 6): Chemistry Problem Solving:** Balancing complex equations, conceptual questions, reasoning.
  - **Day 52 (September 7): Chemistry Problem Solving:** Balancing complex equations, conceptual questions, reasoning.
  - **Day 53 (September 8): Chemistry Problem Solving:** Balancing complex equations, conceptual questions, reasoning.
  - **Day 54 (September 9): Chemistry Problem Solving:** Balancing complex equations, conceptual questions, reasoning.

- **Week 9-10: Biology - Life Processes & Control**
    - **Day 55 (September 10): Life Processes - Nutrition:** Autotrophic and heterotrophic nutrition, digestion in humans.
    - **Day 56 (September 11): Life Processes - Nutrition:** Autotrophic and heterotrophic nutrition, digestion in humans.
    - **Day 57 (September 12): Life Processes - Respiration:** Aerobic and anaerobic, respiration in plants and animals.
    - **Day 58 (September 13): Life Processes - Respiration:** Aerobic and anaerobic, respiration in plants and animals.
    - **Day 59 (September 14): Life Processes - Transportation:** Circulation in humans (blood, heart), transport in plants (xylem, phloem).
    - **Day 60 (September 15): Life Processes - Transportation:** Circulation in humans (blood, heart), transport in plants (xylem, phloem).
    - **Day 61 (September 16): Life Processes - Excretion:** Excretory system in humans, excretion in plants.
    - **Day 62 (September 17): Life Processes - Excretion:** Excretory system in humans, excretion in plants.
    - **Day 63 (September 18): Control & Coordination:** Nervous system, endocrine system in humans, plant hormones.
    - **Day 64 (September 19): Control & Coordination:** Nervous system, endocrine system in humans, plant hormones.
    - **Day 65 (September 20): Biology Problem Solving:** Diagram-based questions, reasoning, application-based.
    - **Day 66 (September 21): Biology Problem Solving:** Diagram-based questions, reasoning, application-based.
    - **Day 67 (September 22): Biology Problem Solving:** Diagram-based questions, reasoning, application-based.
    - **Day 68 (September 23): Biology Problem Solving:** Diagram-based questions, reasoning, application-based.
- **Week 11-12: Mathematics - Advanced Algebra & Geometry**
    - **Day 69 (September 24): Linear Equations in Two Variables:** Graphical and algebraic solutions.

- **Day 70 (September 25): Linear Equations in Two Variables:** Graphical and algebraic solutions.
- **Day 71 (September 26): Quadratic Equations:** Solving methods, nature of roots, applications.
- **Day 72 (September 27): Quadratic Equations:** Solving methods, nature of roots, applications.
- **Day 73 (September 28): Surface Areas & Volumes:** Cylinders, cones, spheres, combinations of solids.
- **Day 74 (September 29): Surface Areas & Volumes:** Cylinders, cones, spheres, combinations of solids.
- **Day 75 (September 30): Mid-Preparation Mock Test 1:** Full-length JSO mock test. Analyze performance and identify weak areas.

Phase 3: Advanced Concepts & Olympiad Skills (Days 76-105) - Interdisciplinary & Higher Order Thinking

Goal: Tackle more challenging problems, explore advanced topics, and develop critical thinking and analytical skills.

- **Week 13-14: Physics - Advanced Topics & Problem Solving**
  - **Day 76 (October 1): Fluid Mechanics (Basic):** Pressure, buoyancy, Archimedes' Principle.
  - **Day 77 (October 2): Fluid Mechanics (Basic):** Pressure, buoyancy, Archimedes' Principle.
  - **Day 78 (October 3): Thermodynamics (Basic):** Laws of thermodynamics, heat engines (conceptual).
  - **Day 79 (October 4): Thermodynamics (Basic):** Laws of thermodynamics, heat engines (conceptual).
  - **Day 80 (October 5): Modern Physics (Introduction):** Atomic models, radioactivity (basic concepts).
  - **Day 81 (October 6): Modern Physics (Introduction):** Atomic models, radioactivity (basic concepts).
  - **Day 82 (October 7): Advanced Physics Problem Solving:** Numerical problems, conceptual questions requiring deeper understanding.
  - **Day 83 (October 8): Advanced Physics Problem Solving:** Numerical problems, conceptual questions requiring deeper understanding.

- **Day 84 (October 9): Advanced Physics Problem Solving:** Numerical problems, conceptual questions requiring deeper understanding.

- **Week 15-16: Chemistry - Stoichiometry & Environmental Chemistry**
  - **Day 85 (October 10): Mole Concept & Stoichiometry:** Molar mass, Avogadro's number, limiting reagent (basic).
  - **Day 86 (October 11): Mole Concept & Stoichiometry:** Molar mass, Avogadro's number, limiting reagent (basic).
  - **Day 87 (October 12): Solutions:** Concentration terms (mass %, volume %, molarity - basic).
  - **Day 88 (October 13): Solutions:** Concentration terms (mass %, volume %, molarity - basic).
  - **Day 89 (October 14): Environmental Chemistry:** Air pollution, water pollution, ozone depletion, greenhouse effect.
  - **Day 90 (October 15): Environmental Chemistry:** Air pollution, water pollution, ozone depletion, greenhouse effect.
  - **Day 91 (October 16): Advanced Chemistry Problem Solving:** Balancing redox reactions, conceptual questions, application-based.
  - **Day 92 (October 17): Advanced Chemistry Problem Solving:** Balancing redox reactions, conceptual questions, application-based.
  - **Day 93 (October 18): Advanced Chemistry Problem Solving:** Balancing redox reactions, conceptual questions, application-based.
- **Week 17-18: Biology - Reproduction, Heredity & Ecosystems**
  - **Day 94 (October 19): Reproduction:** Asexual and sexual reproduction in plants and animals, human reproductive system.
  - **Day 95 (October 20): Reproduction:** Asexual and sexual reproduction in plants and animals, human reproductive system.
  - **Day 96 (October 21): Heredity & Evolution:** Mendel's laws, basic genetics, sex determination, evidence for evolution.
  - **Day 97 (October 22): Heredity & Evolution:** Mendel's laws, basic genetics, sex determination, evidence for evolution.
  - **Day 98 (October 23): Our Environment & Ecosystems:** Food chains, food webs, energy flow, environmental issues.

- **Day 99 (October 24): Our Environment & Ecosystems:** Food chains, food webs, energy flow, environmental issues.
- **Day 100 (October 25): Advanced Biology Problem Solving:** Case studies, experimental setups, reasoning.
- **Day 101 (October 26): Advanced Biology Problem Solving:** Case studies, experimental setups, reasoning.
- **Day 102 (October 27): Advanced Biology Problem Solving:** Case studies, experimental setups, reasoning.

- **Day 103 (October 28): Interdisciplinary Problem Solving & Mock Test 2:** Solve problems that integrate concepts from multiple subjects. Focus on JSO-level questions.
- **Day 104 (October 29): Interdisciplinary Problem Solving & Mock Test 2:** Solve problems that integrate concepts from multiple subjects. Focus on JSO-level questions.
- **Day 105 (October 30): Full-length JSO Mock Test 2.** Thorough analysis of performance.

Phase 4: Revision & Mock Tests (Days 106-120) - Consolidation & Exam Readiness

Goal: Consolidate all learned concepts, refine time management, and build confidence for the actual examination.

- **Week 19: Intensive Revision**
  - **Day 106 (October 31): Physics Revision:** Quick review of all formulas, concepts, and common problem types.
  - **Day 107 (November 1): Physics Revision:** Quick review of all formulas, concepts, and common problem types.
  - **Day 108 (November 2): Chemistry Revision:** Quick review of reactions, periodic trends, and conceptual points.
  - **Day 109 (November 3): Chemistry Revision:** Quick review of reactions, periodic trends, and conceptual points.
  - **Day 110 (November 4): Biology Revision:** Quick review of diagrams, processes, and classification.
  - **Day 111 (November 5): Biology Revision:** Quick review of diagrams, processes, and classification.

- **Day 112 (November 6): Mathematics Revision:** Quick review of formulas, theorems, and problem-solving techniques.

- **Week 20: Mock Tests & Final Polish**
  - **Day 113 (November 7): Full-length JSO Mock Test 3:** Simulate exam conditions strictly.
  - **Day 114 (November 8): Mock Test Analysis & Error Correction:** Deep dive into mistakes, understand conceptual gaps or silly errors.
  - **Day 115 (November 9): Targeted Practice:** Focus on specific weak areas identified from mock tests.
  - **Day 116 (November 10): Quick Review of High-Yield Topics:** Revisit topics that frequently appear in JSO or are conceptually challenging for you.
  - **Day 117 (November 11): Full-length JSO Mock Test 4:** Final comprehensive test to gauge readiness.
  - **Day 118 (November 12): Final Mock Test Analysis & Strategy Refinement:** Adjust time management and question selection strategy.
  - **Day 119 (November 13): Light Revision & Mental Preparation:** Avoid intense study. Relax, review notes, ensure you're calm and confident.
  - **Day 120 (November 14): Rest Day:** Absolutely no new study. Get good sleep, eat well, and prepare for the exam day.

General Tips for JSO Preparation:

1. **NCERT is Your Base:** Ensure a thorough understanding of NCERT textbooks for classes 9 and 10 for all subjects. Many JSO questions are based on these concepts, albeit at a higher difficulty.
2. **Beyond NCERT:** Supplement your study with higher-level books (e.g., those for NTSE, JEE/NEET foundation, or specific Olympiad books) for advanced concepts and problems.
3. **Problem Solving is Key:** The JSO is not just about knowledge but application. Solve a vast number of problems from various sources, including previous year's JSO, NSEJS, and RMO papers.
4. **Conceptual Clarity:** Don't just memorize. Understand the 'why' and 'how' behind every concept.
5. **Interdisciplinary Thinking:** JSO often features questions that combine concepts from different subjects. Practice identifying these connections.

6. **Diagrams and Experiments:** Pay attention to diagrams in Biology and Physics. Understand experimental setups and their principles, even if you're not performing them physically.
7. **Maintain a Notebook:** Keep a dedicated notebook for important formulas, tricky concepts, and problems you found challenging.
8. **Regular Revision:** Consistent short revisions are more effective than cramming.
9. **Time Management:** Practice solving problems under timed conditions. During mock tests, simulate the actual exam environment.
10. **Stay Healthy & Balanced:** Ensure you get adequate sleep, eat nutritious food, and take short breaks. A fresh mind performs best.
11. **Seek Guidance:** Don't hesitate to clarify doubts with teachers, mentors, or peers.
12. **Stay Motivated:** The journey is long, but consistent effort will yield results. Celebrate small victories and learn from setbacks.

Good luck with your Junior Science Olympiad preparation!

120-Day Chemistry Olympiad Preparation Schedule

Start Date: July 18, 2025

End Date: November 14, 2025

This 120-day schedule is meticulously crafted to guide aspiring Chemistry Olympiad participants through a comprehensive and systematic preparation journey. It balances theoretical understanding with extensive problem-solving, focusing on the core areas of Physical, Inorganic, and Organic Chemistry typically covered in Olympiads. The plan emphasizes building a strong foundation, delving into advanced topics, and refining problem-solving strategies through regular practice and mock tests.

Phase 1: Foundation Building (Days 1-30) - Core Concepts & Basics

Goal: Establish a solid understanding of fundamental concepts across all major branches of Chemistry. Focus on clarity and basic problem-solving.

- **Week 1: General Chemistry & Stoichiometry**
    - **Day 1 (July 18): Basic Concepts of Chemistry:** Matter, mixtures, elements, compounds, laws of chemical combination.
    - **Day 2 (July 19): Basic Concepts of Chemistry:** Atomic mass, molecular mass, equivalent mass.
    - **Day 3 (July 20): Atomic Structure:** Subatomic particles, Bohr's model, quantum numbers (basic introduction).
    - **Day 4 (July 21): Atomic Structure:** Electronic configuration, Aufbau, Pauli, Hund's rules.
    - **Day 5 (July 22): Mole Concept & Stoichiometry:** Molar mass, Avogadro's number, empirical/molecular formula.
    - **Day 6 (July 23): Stoichiometry:** Balancing chemical equations, limiting reagent, percentage yield.
    - **Day 7 (July 24): Review & Basic Problems:** Mixed problems on general chemistry and stoichiometry.
- **Week 2: Chemical Bonding & States of Matter**
    - **Day 8 (July 25): Chemical Bonding (Ionic & Covalent):** Lewis structures, octet rule, formal charge.
    - **Day 9 (July 26): Chemical Bonding (VSEPR & Hybridization):** Molecular shapes, bond angles, sp, sp2, sp3 hybridization.

- **Day 10 (July 27): States of Matter (Gases):** Gas laws (Boyle's, Charles's, Gay-Lussac's, Avogadro's), Ideal Gas Equation.
- **Day 11 (July 28): States of Matter (Gases & Liquids):** Dalton's Law of Partial Pressures, Graham's Law of Diffusion, liquid properties (surface tension, viscosity - conceptual).
- **Day 12 (July 29): Solutions:** Types of solutions, concentration terms (molarity, molality, mole fraction, mass %).
- **Day 13 (July 30): Solutions:** Solubility, factors affecting solubility.
- **Day 14 (July 31): Review & Basic Problems:** Mixed problems on bonding, states of matter, and solutions.

- **Week 3: Thermodynamics & Chemical Equilibrium**
  - **Day 15 (August 1): Thermodynamics (Basic):** System, surroundings, types of processes, extensive/intensive properties.
  - **Day 16 (August 2): First Law of Thermodynamics:** Internal energy, heat, work, enthalpy, Hess's Law.
  - **Day 17 (August 3): Chemical Equilibrium:** Law of mass action, equilibrium constant (Kc,Kp), relationship between Kc and Kp.
  - **Day 18 (August 4): Chemical Equilibrium:** Le Chatelier's Principle and its applications.
  - **Day 19 (August 5): Ionic Equilibrium (Basic):** Acids, bases (Arrhenius, Bronsted-Lowry, Lewis - conceptual).
  - **Day 20 (August 6): Ionic Equilibrium (Basic):** pH scale, common ion effect (conceptual).
  - **Day 21 (August 7): Review & Basic Problems:** Mixed problems on thermodynamics and equilibrium.
- **Week 4: Periodic Table & Redox Reactions**
  - **Day 22 (August 8): Periodic Classification of Elements:** Mendeleev's and Modern Periodic Table.
  - **Day 23 (August 9): Periodic Trends:** Atomic radius, ionization enthalpy, electron gain enthalpy, electronegativity.
  - **Day 24 (August 10): Redox Reactions:** Oxidation numbers, oxidizing and reducing agents.

- **Day 25 (August 11): Balancing Redox Reactions:** Ion-electron method, oxidation number method.
- **Day 26 (August 12): Hydrogen & s-block elements:** Position of hydrogen, properties of alkali and alkaline earth metals (basic).
- **Day 27 (August 13): s-block elements:** Important compounds (e.g., NaOH, NaHCO3, CaO - preparation and uses).
- **Day 28 (August 14): Review & Basic Problems:** Mixed problems on periodic table and redox.

- **Day 29 (August 15): Integrated Problem Solving (Phase 1):** Solve mixed problems covering all subjects from basic levels. Focus on understanding question types.
- **Day 30 (August 16): Integrated Problem Solving (Phase 1):** Solve mixed problems covering all subjects from basic levels. Focus on understanding question types.

Phase 2: Deep Dive & Problem Solving (Days 31-80) - Intermediate Concepts & Applications

Goal: Strengthen problem-solving skills, delve deeper into subject-specific topics, and understand interdisciplinary connections.

- **Week 5-6: Chemical Kinetics & Electrochemistry**
  - **Day 31 (August 17): Chemical Kinetics:** Rate of reaction, factors affecting rate, rate law, order and molecularity.
  - **Day 32 (August 18): Chemical Kinetics:** Integrated rate equations (zero and first order), half-life.
  - **Day 33 (August 19): Electrochemistry:** Electrolytic and galvanic cells, electrodes, standard electrode potential.
  - **Day 34 (August 20): Electrochemistry:** Nernst equation, Gibbs energy and cell potential.
  - **Day 35 (August 21): Electrochemistry:** Conductivity, molar conductivity, Kohlrausch's Law, Faraday's laws of electrolysis.
  - **Day 36 (August 22): Surface Chemistry (Conceptual):** Adsorption, catalysts, colloids, emulsions.
  - **Day 37 (August 23): Problem Solving (Kinetics & Electrochemistry).**
  - **Day 38 (August 24): Problem Solving (Kinetics & Electrochemistry).**

- **Day 39 (August 25): Problem Solving (Kinetics & Electrochemistry).**
- **Day 40 (August 26): Problem Solving (Kinetics & Electrochemistry).**

- **Week 7-8: p-block Elements & Metallurgy**
  - **Day 41 (August 27): p-block (Group 13, 14):** Boron and Carbon family - properties, important compounds (e.g., diborane, silicones, carbides).
  - **Day 42 (August 28): p-block (Group 15, 16):** Nitrogen and Oxygen family - properties, important compounds (e.g., ammonia, nitric acid, ozone, sulfuric acid).
  - **Day 43 (August 29): p-block (Group 17, 18):** Halogens and Noble gases - properties, interhalogen compounds, xenon compounds.
  - **Day 44 (August 30): General Principles of Metallurgy:** Ores, concentration methods (gravity separation, froth flotation, leaching).
  - **Day 45 (August 31): Metallurgy:** Extraction methods (roasting, calcination, smelting, refining - electrolytic, zone refining).
  - **Day 46 (September 1): Problem Solving (p-block & Metallurgy).**
  - **Day 47 (September 2): Problem Solving (p-block & Metallurgy).**
  - **Day 48 (September 3): Problem Solving (p-block & Metallurgy).**
  - **Day 49 (September 4): Problem Solving (p-block & Metallurgy).**
- **Week 9-10: d & f-block Elements & Coordination Compounds**
  - **Day 50 (September 5): d-block Elements:** General characteristics, electronic configuration, oxidation states, properties of transition elements.
  - **Day 51 (September 6): d-block Elements:** Important compounds (K2Cr2 O7, KMnO4 - preparation, properties, reactions).
  - **Day 52 (September 7): f-block Elements:** Lanthanoids and Actinoids - electronic configuration, oxidation states, general characteristics (conceptual).
  - **Day 53 (September 8): Coordination Compounds:** Werner's theory, ligands, coordination number, oxidation state of central metal ion.
  - **Day 54 (September 9): Coordination Compounds:** IUPAC nomenclature, isomerism (structural and stereoisomerism - basic).

- **Day 55 (September 10): Coordination Compounds:** Valence Bond Theory (VBT) - basic concepts of bonding and magnetic properties.
- **Day 56 (September 11): Qualitative Analysis (Basic):** Identification of common anions and cations (conceptual understanding of reactions).
- **Day 57 (September 12): Problem Solving (d & f-block, Coordination, Qualitative).**
- **Day 58 (September 13): Problem Solving (d & f-block, Coordination, Qualitative).**
- **Day 59 (September 14): Problem Solving (d & f-block, Coordination, Qualitative).**
- **Day 60 (September 15): Problem Solving (d & f-block, Coordination, Qualitative).**

- **Week 11-12: Organic Chemistry - Basics & Hydrocarbons**
  - **Day 61 (September 16): Basic Principles of Organic Chemistry:** IUPAC nomenclature, classification of organic compounds.
  - **Day 62 (September 17): Isomerism:** Structural isomerism (chain, position, functional, metamerism) and stereoisomerism (geometrical, optical - basic).
  - **Day 63 (September 18): General Organic Chemistry (GOC):** Inductive effect, resonance effect, hyperconjugation, electromeric effect.
  - **Day 64 (September 19): GOC:** Acidity and basicity of organic compounds.
  - **Day 65 (September 20): Hydrocarbons (Alkanes):** Preparation, properties, reactions (free radical halogenation).
  - **Day 66 (September 21): Hydrocarbons (Alkenes):** Preparation, properties, reactions (addition reactions - Markovnikov's, anti-Markovnikov's).
  - **Day 67 (September 22): Hydrocarbons (Alkynes):** Preparation, properties, reactions (acidic nature of terminal alkynes).
  - **Day 68 (September 23): Aromatic Compounds:** Benzene - structure, resonance, aromaticity (Huckel's rule).
  - **Day 69 (September 24): Aromatic Compounds:** Electrophilic aromatic substitution reactions (halogenation, nitration, sulfonation, Friedel-Crafts).

- **Day 70 (September 25): Organic Problem Solving (Mechanisms - basic, synthesis - simple).**
- **Day 71 (September 26): Organic Problem Solving (Mechanisms - basic, synthesis - simple).**
- **Day 72 (September 27): Organic Problem Solving (Mechanisms - basic, synthesis - simple).**

- **Day 73 (September 28): Mid-Preparation Mock Test 1.**
- **Day 74 (September 29): Mock Test 1 Analysis & Error Correction.**
- **Day 75 (September 30): Targeted Practice on Weak Areas from Mock 1.**

Phase 3: Advanced Topics & Olympiad Skills (Days 81-105) - Interdisciplinary & Higher Order Thinking

Goal: Tackle more challenging problems, explore advanced topics, and develop critical thinking and analytical skills.

- **Week 13-14: Organic Chemistry - Functional Groups & Biomolecules**
  - **Day 76 (October 1): Haloalkanes & Haloarenes:** Preparation, properties, reactions (SN1,SN2,E1,E2 - conceptual understanding).
  - **Day 77 (October 2): Haloalkanes & Haloarenes:** Mechanisms and stereochemistry (conceptual).
  - **Day 78 (October 3): Alcohols, Phenols, Ethers:** Preparation, properties, reactions (oxidation, dehydration, electrophilic substitution for phenols).
  - **Day 79 (October 4): Aldehydes & Ketones:** Preparation, properties, nucleophilic addition reactions.
  - **Day 80 (October 5): Aldehydes & Ketones:** Important named reactions (Aldol condensation, Cannizzaro reaction - conceptual).
  - **Day 81 (October 6): Carboxylic Acids & Derivatives:** Preparation, properties, reactions (esterification, decarboxylation).
  - **Day 82 (October 7): Amines:** Classification, preparation, properties, reactions (diazotization - conceptual).
  - **Day 83 (October 8): Biomolecules (Carbohydrates):** Classification, monosaccharides, disaccharides, polysaccharides (structure, functions).
  - **Day 84 (October 9): Biomolecules (Proteins & Nucleic Acids):** Amino acids, peptide bond, protein structure (primary, secondary), DNA/RNA (basic structure).

- **Day 85 (October 10): Advanced Organic Problem Solving:** Multi-step synthesis, reaction prediction, mechanism elucidation.
- **Day 86 (October 11): Advanced Organic Problem Solving.**
- **Day 87 (October 12): Advanced Organic Problem Solving.**
- **Day 88 (October 13): Advanced Organic Problem Solving.**

- **Week 15-16: Environmental Chemistry & Practical Chemistry**
  - **Day 89 (October 14): Environmental Chemistry:** Air pollution (smog, acid rain, ozone depletion), water pollution, soil pollution.
  - **Day 90 (October 15): Environmental Chemistry:** Green chemistry principles, waste management.
  - **Day 91 (October 16): Practical Organic Chemistry:** Qualitative analysis of functional groups (tests for alcohols, aldehydes, ketones, acids, amines).
  - **Day 92 (October 17): Practical Inorganic Chemistry:** Salt analysis (identification of common anions and cations through wet tests).
  - **Day 93 (October 18): Practical Inorganic Chemistry:** Volumetric analysis (titrations - acid-base, redox - conceptual understanding of procedure).
  - **Day 94 (October 19): Analytical Techniques (Conceptual):** Chromatography (TLC, paper), spectroscopy (IR, UV-Vis, NMR - basic principles and interpretation).
  - **Day 95 (October 20): Mixed Advanced Problem Solving (Olympiad Level).**
  - **Day 96 (October 21): Mixed Advanced Problem Solving (Olympiad Level).**
  - **Day 97 (October 22): Mixed Advanced Problem Solving (Olympiad Level).**
  - **Day 98 (October 23): Mixed Advanced Problem Solving (Olympiad Level).**
  - **Day 99 (October 24): Mixed Advanced Problem Solving (Olympiad Level).**
  - **Day 100 (October 25): Mixed Advanced Problem Solving (Olympiad Level).**
- **Day 101 (October 26): Mock Test 2 (Full Syllabus).**

- **Day 102 (October 27): Mock Test 2 Analysis & Detailed Error Review.**
- **Day 103 (October 28): Targeted Practice on Persistent Weaknesses.**
- **Day 104 (October 29): Revisit Key Mechanisms & Exceptions.**
- **Day 105 (October 30): Review of Olympiad Problem-Solving Strategies.**

Phase 4: Grand Revision & Final Mock Tests (Days 106-120) - Consolidation & Exam Readiness

Goal: Consolidate all learned concepts, refine time management, and build peak confidence for the actual examination.

- **Week 17: Intensive Revision - Part 1**
    - **Day 106 (October 31): Full Syllabus Quick Revision (Physical Chemistry):** Formulas, key concepts, common tricky points.
    - **Day 107 (November 1): Full Syllabus Quick Revision (Physical Chemistry):** Solve a few representative problems.
    - **Day 108 (November 2): Full Syllabus Quick Revision (Inorganic Chemistry):** Reactions, periodic trends, conceptual points.
    - **Day 109 (November 3): Full Syllabus Quick Revision (Inorganic Chemistry):** Solve a few representative problems.
    - **Day 110 (November 4): Full Syllabus Quick Revision (Organic Chemistry):** Important reactions, mechanisms, functional group properties.
    - **Day 111 (November 5): Full Syllabus Quick Revision (Organic Chemistry):** Solve a few representative problems.
- **Week 18: Mock Tests & Final Polish**
    - **Day 112 (November 6): Mock Test 3 (Full Syllabus - High Difficulty).**
    - **Day 113 (November 7): Mock Test 3 Detailed Analysis & Strategic Adjustments:** Focus on time management, question selection, and avoiding silly mistakes.
    - **Day 114 (November 8): Targeted Practice on Remaining Critical Weaknesses.**
    - **Day 115 (November 9): Review of Previous Olympiad Papers (Last 2-3 years):** Identify common themes and question styles.
    - **Day 116 (November 10): Mock Test 4 (Full Syllabus - Final Simulation).**

- **Day 117 (November 11): Final Mock Test Analysis & Strategy Refinement.**
- **Day 118 (November 12): Rapid Fire Formula & Concept Recall:** Quick review of all important formulas, reactions, and definitions.
- **Day 119 (November 13): Light Revision & Mental Preparation:** Avoid new topics. Focus on confidence and relaxation. Get good rest.
- **Day 120 (November 14): Rest Day:** Absolutely no new study. Relax, clear your mind, and prepare for the exam day.

General Tips for Chemistry Olympiad Preparation:

1. **NCERT is Essential:** Thoroughly understand NCERT textbooks for classes 11 and 12. They form the base.
2. **Beyond NCERT:** Supplement with advanced textbooks (e.g., Physical Chemistry by P.W. Atkins, Inorganic Chemistry by J.D. Lee, Organic Chemistry by Solomons/Morrison & Boyd) for deeper understanding and advanced concepts.
3. **Problem Solving is Key:** Chemistry Olympiads are highly problem-oriented. Practice a wide variety of numerical, conceptual, and reaction-based problems.
4. **Reaction Mechanisms:** For Organic Chemistry, understand the mechanisms of reactions rather than just memorizing them. This helps in predicting products and multi-step synthesis.
5. **Periodic Trends & Exceptions:** Master periodic trends and pay special attention to exceptions.
6. **Qualitative Analysis:** Understand the principles behind qualitative tests for ions and functional groups.
7. **Maintain a Notebook:** Keep a dedicated notebook for important formulas, reaction mechanisms, tricky concepts, and problems you found challenging.
8. **Regular Revision:** Consistent short revisions are more effective than cramming.
9. **Time Management:** Practice solving problems under timed conditions. During mock tests, simulate the actual exam environment.
10. **Stay Curious & Persistent:** Chemistry can be challenging, but a curious mind and persistence in overcoming difficulties are key to success.
11. **Seek Mentorship:** If possible, find a mentor or join a study group to discuss problems and clarify doubts.

Good luck with your Chemistry Olympiad preparation!