

# SCO INTERNATIONAL PHYSICS OLYMPIAD

## CLASS 10 OFFICIAL SYLLABUS

Chapter-wise notes and learning outcomes  
For students, teachers, schools and parents preparing globally

**Designed from Class 10 Physics syllabus pathways and aligned with SCO's platform flow for guided preparation, practice, reporting and future-ready science learning.**

- grade-fit physics learning across optics, electricity, magnetism and energy systems
- international-style MCQ reasoning using diagrams, numerical thinking and evidence-based explanation
- Ready academic format for schools, teachers, parents and students

Optics	Human Eye	Electricity	Magnetism	Energy
Reflection & Refraction	Vision	Circuits	Safety	Sources

## SCO International Physics Olympiad - Class 10 Official Syllabus

The Class 10 Physics Olympiad syllabus is designed to build strong conceptual foundations in optics, electricity, magnetism and energy systems. It supports both school curriculum alignment and olympiad-level reasoning through application, evidence, modelling and numerical problem solving.

### Global Standard Alignment

This Class 10 physics document is structured for conceptual clarity, numerical reasoning, practical application and scientific literacy. The learning design is benchmarked against international physics and science-learning expectations including NGSS Physical Science, Cambridge IGCSE Physics, OECD/PISA science literacy and pre-university physics-olympiad progression.

- Conceptual model building: ray diagrams, circuit models, field models and energy-system models.
- Quantitative reasoning: formula selection, unit handling, proportionality and estimation.
- Application in real contexts: household safety, renewable energy, optical devices and medical/technology applications.
- Higher-order extension: multi-step numericals and evidence-based reasoning in the Achievers Section.

### Exam Blueprint

Section	Question Range	Learning Focus	Marks Orientation
General Understanding	1-20	Core concepts, laws, formulae and definitions	1 mark each
Case Study	21-30	Applied physics in school, home, environment and technology	1 mark each
Reason and Assertion	31-40	Conceptual explanation and logical relation	1 mark each
Achievers Section	41-50	Multi-step numerical and higher-order reasoning	2 marks each

### Chapter-wise Syllabus, Notes and Learning Outcomes

No.	Chapter	Small Notes for Learning	Learning Outcomes
1	Reflection of Light	Mirror behaviour, laws of reflection, image formation by plane/concave/convex mirrors, ray diagrams, mirror formula and practical applications.	Students should predict image position, size and nature using ray diagrams and apply reflection concepts to safety and real-life optical devices.
2	The Human Eye and Colourful World	Structure and function of the human eye, accommodation, defects of vision, correction lenses, dispersion, atmospheric refraction and scattering.	Students should explain vision defects, corrective lenses, colour perception, prism spectrum and natural optical phenomena such as rainbows and sky colour.
3	Electricity	Current, potential difference, resistance, Ohm's law, series/parallel circuits, electrical power, heating effect, fuses and safe household wiring.	Students should solve circuit problems, compare energy use, apply safety rules and interpret electrical quantities in everyday contexts.
4	Magnetic Effects of Electric Current	Magnetic field around conductors, solenoids, electromagnets, force on a current-carrying conductor, electric	Students should use hand rules, explain motor/electromagnet operation and connect magnetic effects to modern devices.

		motor and electromagnetic induction basics.	
5	Sources of Energy	Conventional and renewable sources, energy conversion, efficiency, environmental impact, sustainability and responsible technology choices.	Students should evaluate energy sources based on efficiency, renewability, cost, reliability and environmental consequences.
6	Refraction of Light	Refraction through media, refractive index, Snell's law, glass slabs, lenses, lens formula, power of lens and applications in cameras, magnifiers and spectacles.	Students should trace refracted rays, calculate refractive index or lens power and analyze optical systems using grade-appropriate mathematics.

## Preparation Roadmap for Students

**Foundation:** Learn definitions, diagrams, laws and key formulae chapter by chapter.

**Application:** Solve daily-life examples: mirrors, spectacles, household circuits, motors and energy bills.

**Reasoning:** Explain why each wrong option is incorrect; this builds olympiad-level discrimination.

**Numerical Skill:** Practise unit conversion, sign convention, Ohm's law, power/energy and simple optics formulae.

**Revision:** Maintain a one-page formula sheet and review mistakes after each mock test.

## Teacher and School Implementation Notes

- Use ray diagrams and circuit diagrams before numerical practice.
- Encourage students to write one-line reasoning for each MCQ answer.
- Use lab demonstrations wherever possible: mirror images, glass slab refraction, resistor combinations and electromagnets.
- Connect energy lessons to sustainability, local resources and responsible technology choices.
- Assess learning through short quizzes, case questions, misconception checks and discussion of answer explanations.

### Global Reference Snapshot

- NGSS High School Physical Science: waves, electromagnetic radiation, energy and field interactions.
- Cambridge IGCSE Physics 0625: waves/light, electricity, magnetism and energy applications.
- OECD/PISA Science Literacy: explaining phenomena, evaluating inquiry and interpreting evidence.
- International Physics Olympiad syllabus progression: optics, electrical circuits, magnetic fields and energy reasoning at higher levels.