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SCO INTERNATIONAL OLYMPIAD

CLASS 11 BIOLOGY

OFFICIAL SYLLABUS

SCO International Biology Olympiad

- Chapter-wise syllabus, learning notes and outcomes for students, teachers and schools
- Aligned with global pre-university biology learning, inquiry skills and Olympiad-style reasoning.

Living World	Classification	Plant Kingdom	Animal Kingdom	Biomolecules
Plant Physiology	Human Physiology	Research Skills	Data Literacy	Global Standard

SCO International Biology Olympiad - Class 11 Official Syllabus

This syllabus is designed for globally relevant senior-secondary biology learning. It connects foundational Class 11 biology with inquiry, data interpretation, physiology, cell biology, plant science, biotechnology awareness and Olympiad-style reasoning. The document is intended for students, teachers, schools, parents and academic coordinators preparing learners for SCO International Olympiad assessment.

Exam Snapshot

Field	Details
Exam Name	SCO International Biology Olympiad
Class / Grade	Class 11
Duration	60 minutes
Question Format	Objective MCQ with assertion-reason, case-based and higher-order application questions
Core Skills	Conceptual clarity, scientific reasoning, data interpretation, biological vocabulary, application to new contexts
Recommended Preparation	Chapter reading, diagram practice, concept maps, MCQ practice, explanation writing and review of mistakes

Global Standard Alignment

• Pre-university biology breadth: biodiversity, systematics, cell biology, biomolecules, plant physiology, animal physiology, genetics, evolution, ecology and biotechnology awareness.

• Inquiry and application orientation: learners should not only recall facts but interpret biological data, explain mechanisms, apply models and make evidence-based conclusions.

• Olympiad readiness: the syllabus prepares students for non-routine MCQs, assertion-reason logic, case studies, experimental reasoning and higher-order Achievers questions.

• Future-readiness: links biological concepts with medicine, agriculture, environment, biotechnology, genomics, sustainability and responsible science communication.

Chapter-wise Syllabus, Small Notes and Learning Outcomes

No.	Chapter Name	Small Notes for Learning	Learning Outcomes
1	The Living World	Builds the foundation of biology by studying the characteristics of living organisms, levels of organization, taxonomy and the need for scientific classification.	Define life using observable and molecular criteria; apply taxonomic hierarchy and nomenclature to classify organisms accurately.
2	Biological Classification	Develops understanding of major kingdoms, microbial diversity, viruses, lichens, and the changing nature of biological classification.	Compare classification systems, identify diagnostic features of major groups, and interpret simple classification scenarios.
3	Plant Kingdom	Introduces algae, bryophytes, pteridophytes, gymnosperms and angiosperms with life cycles and evolutionary trends.	Distinguish plant groups using structure, reproduction and alternation of generations; connect plant diversity to adaptation.

4	Animal Kingdom	Covers animal classification, body plans, symmetry, coelom, segmentation, germ layers and major phyla.	Use key animal features to classify organisms and explain how structure supports survival and function.
5	Morphology of Flowering Plants	Explains external structures of roots, stems, leaves, flowers, fruits and seeds, including modifications.	Identify plant organs and modifications; relate morphology to nutrition, support, protection and reproduction.
6	Anatomy of Flowering Plants	Studies tissues, tissue systems and internal organization of dicot and monocot roots, stems and leaves.	Interpret anatomical features and explain how tissues support transport, growth, storage and protection.
7	Structural Organisation in Animals	Focuses on animal tissues and organ-system organization using representative organisms and human relevance.	Differentiate epithelial, connective, muscular and nervous tissues; link tissue structure with physiological function.
8	Cell: The Unit of Life	Covers cell theory, prokaryotic and eukaryotic cells, membranes, organelles and microscopy-based cell understanding.	Explain cell organization, compare cell types, and connect organelle structure to cellular function.
9	Biomolecules	Introduces carbohydrates, lipids, proteins, nucleic acids, enzymes and metabolism as the chemical basis of life.	Classify major biomolecules, explain enzyme action, and apply biomolecular concepts to biological processes.
10	Cell Cycle and Cell Division	Covers interphase, mitosis, meiosis, checkpoints, chromosome behavior and significance of cell division.	Sequence cell-cycle events, compare mitosis and meiosis, and explain how errors can affect growth, heredity and disease.
11	Transport in Plants	Studies water potential, diffusion, osmosis, xylem transport, phloem translocation and transpiration.	Explain mechanisms of plant transport and interpret factors affecting water movement and sugar translocation.
12	Mineral Nutrition	Explains essential elements, deficiency symptoms, nitrogen metabolism and nutrient roles in plant growth.	Identify macro- and micronutrient roles, diagnose common deficiency patterns, and explain biological nitrogen assimilation.
13	Photosynthesis in Higher Plants	Covers pigments, light reactions, Calvin cycle, C3/C4 pathways, photorespiration and factors affecting photosynthesis.	Analyze how plants capture light energy, fix carbon and adapt photosynthesis to environmental conditions.

14	Respiration in Plants	Explains glycolysis, fermentation, Krebs cycle, electron transport, ATP generation and respiratory quotient.	Trace energy flow in respiration, compare aerobic and anaerobic pathways, and calculate/interpret basic respiratory outcomes.
15	Plant Growth and Development	Introduces growth curves, differentiation, hormones, photoperiodism, vernalization and plant responses.	Explain how hormones and environmental signals regulate plant growth, development and reproduction.
16	Digestion and Absorption	Covers the digestive system, enzymes, nutrient breakdown, absorption and disorders related to digestion.	Follow the path of digestion, match enzymes to substrates, and explain nutrient absorption and common digestive issues.
17	Breathing and Exchange of Gases	Studies respiratory organs, mechanism of breathing, gas exchange, transport of gases and respiratory regulation.	Apply principles of diffusion and transport to explain oxygen uptake, carbon dioxide removal and respiratory disorders.
18	Body Fluids and Circulation	Covers blood, lymph, heart structure, cardiac cycle, blood pressure, ECG and circulation disorders.	Explain components of blood, cardiac function and circulation; interpret simple physiological cases related to transport.
19	Excretory Products and Their Elimination	Explains nitrogenous wastes, nephron structure, urine formation, osmoregulation and renal disorders.	Describe filtration, reabsorption and secretion; connect kidney function to homeostasis and waste management.
20	Locomotion and Movement	Covers skeletal muscle, contraction mechanism, bones, joints and movement-related disorders.	Explain muscle contraction, identify skeletal components, and relate movement mechanics to health and performance.
21	Neural Control and Coordination	Introduces neurons, nerve impulse transmission, synapses, central/peripheral nervous systems and sense organs.	Explain neural signaling, reflexes and coordination; interpret cases involving sensory and motor responses.
22	Chemical Coordination and Integration	Covers endocrine glands, hormones, feedback regulation and links between nervous and endocrine control.	Identify major hormones and glands; explain feedback loops and hormonal regulation of growth, metabolism and homeostasis.

Pedagogical Guidance for Schools and Teachers

Concept-first teaching: Begin each chapter with a clear biological problem, such as how plants transport water against gravity or how p53 prevents uncontrolled cell growth.

Diagram and model literacy: Use labelled diagrams, flow charts and model-building activities for taxonomy, plant anatomy, cell division, photosynthesis, respiration, circulation and neural control.

Evidence-based reasoning: Train learners to justify answers using observable data, experimental evidence, cause-effect logic and correct biological terminology.

Case-study practice: Include disease scenarios, crop deficiency cases, biotechnology examples and environmental applications to build transfer of learning.

Misconception checks: Use short concept quizzes to address common errors, such as confusing mitosis with meiosis, xylem with phloem, or hormones with enzymes.

Preparation Roadmap for Students

• Weeks 1-3: Living world, classification, plant and animal kingdoms; make comparison charts and taxonomy flashcards.

• Weeks 4-6: Plant morphology/anatomy and animal tissues; practise diagrams and structure-function reasoning.

• Weeks 7-9: Cell biology, biomolecules and cell division; focus on mechanisms, enzymes and checkpoint logic.

• Weeks 10-12: Plant physiology; connect transport, nutrition, photosynthesis, respiration and growth regulation.

• Weeks 13-15: Human physiology; revise digestion, breathing, circulation, excretion, movement, neural and endocrine coordination.

• Final revision: Attempt mixed MCQs, assertion-reason sets and case studies; review every wrong answer by writing a one-line correction.

Assessment Blueprint

Field	Details
Core Knowledge	Terminology, principles, definitions, structures and pathways
Application	Biological concepts applied to unfamiliar examples, data or real-life contexts
Reasoning	Assertion-reason logic, cause-effect interpretation and elimination of distractors
Data/Case Reading	Short case studies, experiment-based conclusions and diagnosis of biological situations
Achievers Level	Higher-order thinking involving integration across chapters, current biology and quantitative reasoning

Recommended Student Learning Habits

• Maintain a biology vocabulary notebook with one example for every important term.

• Draw and redraw key diagrams from memory, then check labels and functions.

• After solving each MCQ, explain why the other options are incorrect.

• Practise interpreting graphs, tables, experimental results and simple numerical biology cases.

• Connect each chapter to an authentic context such as health, agriculture, environment, biotechnology or sustainability.

Reference Alignment Used for Academic Benchmarking

• International Biology Olympiad topic distribution: cell biology, plant anatomy and physiology, animal anatomy and physiology, genetics/evolution, ecology and biosystematics.

• Cambridge International AS & A Level Biology 9700: conceptual understanding, application in novel contexts and advanced practical-skill emphasis.

• AP Biology: chemistry of life, cells, cellular energetics, cell communication/cell cycle, heredity, gene expression, natural selection and ecology.

• NGSS High School Life Science: structure and function, inheritance and variation, matter and energy, interdependent relationships and evolution.