

SCO INTERNATIONAL BIOLOGY OLYMPIAD

CLASS 8 SYLLABUS

Structured syllabus for students, teachers, schools, and parents
Designed for guided preparation and future-ready biology learning

Designed from Class 8 Biology Olympiad pathways and aligned with SCO's academic preparation, practice, reporting, and future-ready science learning goals.

- chapter-wise biological science concepts with classroom-ready learning outcomes
- age-fit scientific reasoning across cells, microorganisms, agriculture, health, environment, and conservation
- teacher/school guidance for observation, investigation, diagrams, case studies, and assessment readiness

Biology	Microbes	Cells	Genetics	Health
Agriculture	Conservation	Pollution	Achievers	Research Skills

SCO International Biology Olympiad - Class 8 Syllabus

Official Syllabus Guide for Students, Teachers, Schools, and Parents

This syllabus develops biology understanding through observation, classification, investigation, diagrams, data interpretation, and real-life case studies. It connects middle-school biology with sustainable agriculture, microorganisms, cell biology, reproduction, adolescent health, conservation, environmental pollution, and modern biotechnology.

Exam Name	SCO International Biology Olympiad
Class / Grade	Class 8 / Grade 8
Duration	60 minutes
Type of Exam	Objective Type Multiple Choice Questions
Recommended Question Count	50 questions
Core Skills	Concept recall, scientific reasoning, case analysis, data interpretation, diagram-based thinking
Preparation Focus	Biology concepts, responsible science, sustainability, health, environment, and higher-order reasoning

Chapter-wise Syllabus with Learning Outcomes

Chapter 1 Sustainable Agriculture and Soil Fertility

Chapter Note: Understand organic compost, crop rotation, cover crops, soil microorganisms, and sustainable yield management.

Learning Outcome: Learners explain how farm practices can protect soil health and long-term food security.

Chapter 2 Crop Protection, Pest Management and Biocontrol

Chapter Note: Study IPM, natural pest enemies, biocontrol agents, plant pathogens, and responsible pesticide use.

Learning Outcome: Learners identify sustainable pest-control methods and compare them with chemical-only strategies.

Chapter 3 Microorganisms in Food, Health and Environment

Chapter Note: Explore fermentation, antibiotics, antibiotic resistance, bioremediation, and beneficial microbes.

Learning Outcome: Learners connect microorganisms with food production, disease control, pollution cleanup, and public health.

Chapter 4 Biodiversity, Keystone Species and Conservation

Chapter Note: Study endangered species, invasive species, keystone species, ecosystem balance, and conservation actions.

Learning Outcome: Learners explain why species protection and habitat preservation matter for ecosystem stability.

Chapter 5 Habitat Fragmentation and Genetic Diversity

Chapter Note: Understand gene flow, inbreeding, wildlife corridors, captive breeding, and reintroduction strategies.

Learning Outcome: Learners analyze how fragmentation reduces adaptability and how corridors support genetic exchange.

Chapter 6 Cell Structure and Organelles

Chapter Note: Review mitochondria, ribosomes, endoplasmic reticulum, Golgi apparatus, peroxisomes, chloroplasts, and nucleus.

Learning Outcome: Learners match cell structures to functions such as ATP production, protein synthesis, detoxification, and transport.

Chapter 7 Cell Transport, Diffusion and Membrane Function

Chapter Note: Study diffusion, concentration gradient, membrane transport, vesicular movement, and cytoskeleton roles.

Learning Outcome: Learners use scientific laws and models to explain how materials move within and across cells.

Chapter 8 Reproduction and Development in Animals

Chapter Note: Study fertilization, metamorphosis, gestation, hormones, ovulation, and temperature-related development.

Learning Outcome: Learners compare reproductive strategies and explain how development is influenced by biological and environmental factors.

Chapter 9 Puberty, Hormones and Adolescent Health

Chapter Note: Understand adolescence, growth spurts, sex hormones, bone density, nutrition, and physical activity.

Learning Outcome: Learners relate healthy habits and hormonal changes to adolescent development.

Chapter 10 Plant Growth, Plant Health and Adaptation

Chapter Note: Explore plant growth regulators, root nodules, stomata, drought tolerance, and plant disease symptoms.

Learning Outcome: Learners connect plant structures and adaptations with survival, productivity, and environmental stress.

Chapter 11 Environmental Pollution: Air, Water and Soil

Chapter Note: Study acid rain, sulfur dioxide, PM2.5, heavy metals, wastewater, and environmental health risks.

Learning Outcome: Learners identify pollutants, their sources, and their effects on living systems.

Chapter 12 Water Treatment, Microplastics and Bioremediation

Chapter Note: Examine filtration, ion exchange, biosorption, algae-based remediation, nanofilters, and microplastic concerns.

Learning Outcome: Learners evaluate modern and nature-based methods for improving water quality.

Chapter 13 Biotechnology, CRISPR and Modern Biology

Chapter Note: Introduce CRISPR, drought-tolerant crops, genetic modification, microbiome research, and research ethics.

Learning Outcome: Learners describe how modern biology can solve problems while requiring safety and ethical responsibility.

Chapter 14 Gut Microbiome and Human Health

Chapter Note: Study gut bacteria, short-chain fatty acids, immunity, inflammation, and balanced health.

Learning Outcome: Learners explain how beneficial microbes support digestion, immunity, and overall well-being.

Chapter 15 Integrated Case Studies and Achievers Biology Reasoning

Chapter Note: Apply concepts through case studies, assertion-reason, diagrams, data interpretation, and interdisciplinary reasoning.

Learning Outcome: Learners solve higher-order questions by linking biology with chemistry, physics, environment, and real-world decision-making.

Assessment Blueprint

Section	Suggested Questions	Assessment Focus
General Biology	20	Core concepts, definitions, diagrams, and short application questions
Case Study and Contemporary Biology	15	Applied biology scenarios connected to agriculture, health, conservation, and environment
Reason and Assertion	5	Scientific statement evaluation and cause-effect reasoning
Achievers Section	10	Higher-order interdisciplinary questions with advanced biological reasoning

Preparation Roadmap

- **Learn:** Read the chapter note, understand key terms, and draw important diagrams such as cell organelles, plant parts, and ecological cycles.
- **Practice:** Solve MCQs, assertion-reason questions, and diagram-based questions after each chapter.
- **Investigate:** Use safe classroom activities such as observing plant parts, comparing leaf structures, studying composting, and interpreting water-quality cases.
- **Apply:** Connect biology with real-world decisions in health, agriculture, biodiversity, pollution control, and sustainability.
- **Review:** Maintain an error notebook for wrong answers and revise explanations, not just final answers.

Teacher and School Implementation Notes

- Use diagrams and short experiments to connect textbook biology with observable evidence.
- Encourage students to explain answers using scientific vocabulary such as hypothesis, evidence, adaptation, diffusion, fertility, and diversity.
- Use case studies on agriculture, water, pollution, and conservation to promote responsible scientific thinking.
- Give students mixed practice across direct MCQs, assertion-reason, and Achievers-level application problems.

PDF Publishing Font Guidance

Recommended font sizes for PDF conversion: H2 16 pt, H3 12.5-13 pt, body 10.5-11 pt, table text 8.3-9 pt. These sizes balance readability and page efficiency for web preview and download.