Western Australia

The new Biological Sciences course for WA covers two years, during which students will take one of two course combinations. In the first option, students take Units 1ABIO and 1BBIO in Year 11 and Units 2ABIO and 2BBIO in Year 12. In the second option, students take Units 2ABIO and 2BBIO in Year 11 and Units 3ABIO and 3BBIO in Year 12. Course material is covered in the workbook in the topics indicated. The CD-ROM symbol indicates that material is available on the Teacher Resource CD-ROM.

Biological Sciences

Unit 2ABIO

	Topic in Workbook Year 11 unless indicated
Ecosystems: Biodiversity & Sustainability	
Classification	
Classification system, binomial classification.	Classification
Taxonomic keys.	● Classification Practical
Communities	
Autotrophs, heterotrophs, decomposers. Energy flow in food chains, webs, and ecological pyramids.	Communities ● Cave Food Webs
Cycling of matter The carbon and nitrogen cycles.	Communities
Productivity in communities	
Biomass and trophic levels. Community productivity.	Communities
The Functioning Organism	
Requirements of living organisms	
Energy.	Cellular Processes
Water, nutrient requirements.	Animal & Plant Nutrition
Waste removal.	Transport & Excretion
Photosynthesis, respiration, fermentation.	Cellular Processes Yr 12 Cellular Energetics ● Chemiosmosis
Carbohydrates, lipids, and proteins.	Yr 12 The Chemistry of Life
Cell Structures and functions	
Cell structure and organelles.	Yr 12 The Chemistry of Life
Eukaryote & prokaryote cells, plant & animal cells.	Cell Structure
Exchange of materials	
Diffusion and osmosis. SA:V ratio, concentration gradient.	Cellular Processes ● Osmosis & Water Potential
Adaptations	
Adaptations of plants and animals to terrestrial, marine and freshwater habitats.	Environment & Adaptation
Adaptations of plant and animal transport systems.	Transport & Excretion
Adaptations for gas exchange. Gas Exchange surfaces.	Gas Exchange Cellular Processes ● Cell Processes Overview
Adaptations for excretion in plants and animals.	Transport & Excretion
Adaptations for nutrient acquisition.	Plant & Animal Nutrition
Working as a Biologist	
Planning and conducting biological research	
Hypothesis formation, planning and conducting experiments.	Skills in Biology
Microscopy techniques, magnification calculation.	Cell Structure
Written and oral reports.	Skills in Biology
Use of classification keys.	Classification

Unit 2BBIO

Ecosystems: Biodiversity & Sustainability	
Population dynamics	
Population dynamics and change, competition. Carrying capacity, population calculations.	Population Dynamics
Continuity of Species	
Mitosis and the cell cycle.	Cellular Processes Yr 12 Cell Division & Cloning
Asexual and sexual reproduction in plants and animals. Comparisons of each strategy.	Reproduction & Development
Offspring survival strategies.	Environment & Adaptation
Life-cycles. Metamorphosis.	Reproduction & Development
Process and functions of meiosis.	Yr 12 Inheritance
DNA	Yr 12 The Genetic Code
Genes and chromosomes.	Yr 12 The Genetic Code
Monohybrid crosses, pedigree charts. Environment and genotype. Sex determination.	Yr 12 Inheritance
Working as a Biologist	
Planning and conducting biological research	
Hypothesis formation, planning and conducting experiments using controlled variables.	Skills in Biology
Ecosystem study and field sampling methods. Computer modeling of population dynamics.	Practical Ecology
Evaluating and communicating as a biologist	
Written and oral reports, critical reflection.	Skills in Biology

Unit 3ABIO

	Topic in Workbook Year 12 unless indicated
Ecosystems: Biodiversity & Sustainability	
Biodiversity	
Genetic, species, and ecosystem biodiversity.	Yr 11 Human Impact on Ecosystems
Ecosystems	
Types of ecosystems, inputs and outputs, productivity, recycling and flux.	Yr 11 Communities
Environmental issues and human impact	
E.g. deforestation, ozone depletion, agriculture, biomagnification, salinity, greenhouse gases.	Yr 11 Human Impact on Ecosystems ● Human Impact on Ecosystems
The Functioning Organism	
Photosynthesis	
Photosynthesis equation, factors affecting photosynthesis.	Cellular Energetics Yr 11 Plant & Animal Nutrition
Respiration	
Aerobic and anaerobic pathways, factors affecting cellular respiration.	Cellular Energetics ● Chemiosmosis
Energy transfer	
ATP and ADP cycles	Cellular Energetics
Control of cellular activities	
Membrane structure and function, active transport.	Yr 11 Cellular Processes
Enzyme structure and function, factors affecting enzyme activity, role of enzymes.	The Chemistry of Life
Homeostasis mechanisms	
Homeostasis principles and negative feedback.	Principles of Homeostasis ● Detecting Changing States
Homeostasis is animals	
Water balance, temperature regulation, adaptation for excretion and homeostasis.	Homeostasis & Adaptation ● Special Senses Yr 11 Transport & Excretion
Homeostasis is plants	
Water balance, water absorption, transpiration.	Yr 11 Gas Exchange
Adaptations for temperature regulation.	Control & Coordination
Working as a Biologist	
Planning and conducting biological research	
Design, analyse and evaluate experiments.	Skills in Biology
Design and conduct an investigation.	
Conduct a cytological or biochemical tests.	
Microscopy techniques	Yr 11 Cell Structure
Evaluating and communicating as a biologist	
Intepret results of cellar chemistry and processes.	
Multimedia use to communicate findings.	

Unit 3BBIO

Ecosystems: Biodiversity & Sustainability	
Conservation	
Need for conservation. Conservation strategies.	Yr 11 Human Impact on Ecosystems
Continuity of Species	
DNA, techniques and technologies	
DNA replication, protein synthesis.	The Genetic Code
Cloning and genetic modification, recombinant DNA technology, applications of DNA technologies.	Gene Technology Cell Division & Cloning
Variation	
Meiosis and variation.	Inheritance
Sources of variation.	Mutations
Isolation and selection	
Barriers to gene flow. Natural and artificial selection, selective pressure.	Population Genetics
Speciation / evolution	
Gene pools, factors affecting allele frequency.	Population Genetics
Evidence for evolution	
Evolutionary relationships, evidence for evolution.	The Evidence for Evolution
Working as a Biologist	
Planning and conducting biological research	
Design and develop an investigation.	Skills in Biology
Microscopy, SI units, critique a published study.	Cell Structure
Evaluating and communicating as a biologist	
Limitations and considerations of biotechnology, ability to defend or debate findings, use of biological knowledge to evaluate findings.	