

# 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.

Biological Sciences	Topic in Workbook Year 11 unless indicated	Topic in Workbook Year 12 unless indicated
<b>Unit 2ABIO</b>		
<p><b>Ecosystems: Biodiversity &amp; Sustainability</b></p> <p><b>Classification</b> Classification system, binomial classification. Taxonomic keys.</p> <p><b>Communities</b> Autotrophs, heterotrophs, decomposers. Energy flow in food chains, webs, and ecological pyramids.</p> <p>Cycling of matter The carbon and nitrogen cycles.</p> <p><b>Productivity in communities</b> Biomass and trophic levels. Community productivity.</p> <p><b>The Functioning Organism</b></p> <p><b>Requirements of living organisms</b> Energy. Water, nutrient requirements. Waste removal.</p> <p>Photosynthesis, respiration, fermentation.</p> <p>Carbohydrates, lipids, and proteins.</p> <p><b>Cell Structures and functions</b> Cell structure and organelles. Eukaryote &amp; prokaryote cells, plant &amp; animal cells.</p> <p><b>Exchange of materials</b> Diffusion and osmosis. SA:V ratio, concentration gradient.</p> <p><b>Adaptations</b> Adaptations of plants and animals to terrestrial, marine and freshwater habitats. Adaptations of plant and animal transport systems. Adaptations for gas exchange. Gas Exchange surfaces. Adaptations for excretion in plants and animals. Adaptations for nutrient acquisition.</p> <p><b>Working as a Biologist</b></p> <p><b>Planning and conducting biological research</b> Hypotheses, planning and conducting experiments. Microscopy techniques, magnification calculation. Written and oral reports. Use of classification keys.</p>	<p>Classification</p> <p>Communities</p> <p>Communities</p> <p>Communities</p> <p>Cellular Processes Animal &amp; Plant Nutrition Transport &amp; Excretion</p> <p>Plant &amp; Animal Nutrition Year 12: Cellular Energetics</p> <p>Cell Structure</p> <p>Cell Structure</p> <p>Cellular Processes</p> <p>Environment &amp; Adaptation</p> <p>Transport &amp; Excretion</p> <p>Gas Exchange Cellular Processes</p> <p>Transport &amp; Excretion Plant &amp; Animal Nutrition</p> <p>Skills in Biology Cell Structure Skills in Biology Classification</p>	<p>Year 11: Human Impact on Ecosystems</p> <p>Year 11: Communities</p> <p>Year 11: Human Impact on Ecosystems</p> <p>Cellular Energetics</p> <p>Cellular Energetics</p> <p>Cellular Energetics</p> <p>Year 11: Cellular Processes The Chemistry of Life</p> <p>Principles of Homeostasis</p> <p>Homeostasis &amp; Adaptation</p> <p>Year 11: Transport &amp; Excretion Control &amp; Coordination</p> <p>Skills in Biology</p> <p>Year 11: Cell Structure</p>
<b>Unit 2BBIO</b>		
<p><b>Ecosystems: Biodiversity &amp; Sustainability</b></p> <p><b>Population dynamics</b> Population dynamics and change, competition. Carrying capacity, population calculations.</p> <p><b>Continuity of Species</b> Mitosis and the cell cycle.</p> <p>Asexual and sexual reproduction in plants and animals. Comparisons of each strategy.</p> <p>Offspring survival strategies.</p> <p>Life-cycles. Metamorphosis.</p> <p>Process and functions of meiosis.</p> <p>DNA Genes and chromosomes. Monohybrid crosses, pedigree charts. Environment and genotype. Sex determination.</p> <p><b>Working as a Biologist</b></p> <p><b>Planning and conducting biological research</b> Hypothesis formation, planning and conducting experiments using controlled variables. Ecosystem study and field sampling methods. Computer modeling of population dynamics.</p> <p><b>Evaluating and communicating as a biologist</b> Written and oral reports, critical reflection.</p>	<p>Population Dynamics</p> <p>Cellular Processes</p> <p>Reproduction &amp; Development</p> <p>Environment &amp; Adaptation</p> <p>Reproduction &amp; Development</p> <p>Year 12: Inheritance</p> <p>Cell Structure Year 12: The Genetic Code Year 12: Inheritance</p> <p>Skills in Biology</p> <p>Practical Ecology</p> <p>Skills in Biology</p>	<p>Year 11: Human Impact on Ecosystems</p> <p>The Genetic Code Gene Technology Cell Division &amp; Cloning</p> <p>Inheritance Mutations</p> <p>Population Genetics</p> <p>Population Genetics</p> <p>The Evidence for Evolution</p> <p>Skills in Biology Cell Structure</p> <p>Cell Division &amp; Cloning Gene Technology</p>
<b>Unit 3ABIO</b>		
<p><b>Ecosystems: Biodiversity &amp; Sustainability</b></p> <p><b>Biodiversity</b> Genetic, species, and ecosystem biodiversity.</p> <p><b>Ecosystems</b> Types of ecosystems, inputs and outputs, productivity, recycling and flux.</p> <p><b>Environmental issues and human impact</b> E.g. deforestation, ozone depletion, agriculture, biomagnification, salinity, greenhouse gases.</p> <p><b>The Functioning Organism</b></p> <p><b>Photosynthesis</b> Photosynthesis equation, factors affecting photosynthesis.</p> <p><b>Respiration</b> Aerobic and anaerobic pathways, factors affecting cellular respiration.</p> <p><b>Energy transfer</b> ATP and ADP cycles</p> <p><b>Control of cellular activities</b> Membrane structure and function, active transport. Enzyme structure and function, factors affecting enzyme activity, role of enzymes.</p> <p><b>Homeostasis mechanisms</b> Homeostasis principles and negative feedback.</p> <p><b>Homeostasis in animals</b> Water balance, temperature regulation, adaptation for excretion and homeostasis.</p> <p><b>Homeostasis in plants</b> Water balance, water absorption, transpiration. Adaptations for temperature regulation.</p> <p><b>Working as a Biologist</b></p> <p><b>Planning and conducting biological research</b> Design, analyse and evaluate experiments. Design and conduct an investigation. Conduct a cytological or biochemical tests. Microscopy techniques</p> <p><b>Evaluating and communicating as a biologist</b> Interpret results of cellular chemistry and processes. Multimedia use to communicate findings.</p>	<p>Cellular Energetics</p> <p>Cellular Energetics</p> <p>Cellular Energetics</p> <p>Year 11: Cellular Processes The Chemistry of Life</p> <p>Principles of Homeostasis</p> <p>Homeostasis &amp; Adaptation</p> <p>Year 11: Transport &amp; Excretion Control &amp; Coordination</p> <p>Skills in Biology</p> <p>Year 11: Cell Structure</p>	<p>Year 11: Human Impact on Ecosystems</p> <p>Year 11: Communities</p> <p>Year 11: Human Impact on Ecosystems</p> <p>Cellular Energetics</p> <p>Cellular Energetics</p> <p>Cellular Energetics</p> <p>Year 11: Cellular Processes The Chemistry of Life</p> <p>Principles of Homeostasis</p> <p>Homeostasis &amp; Adaptation</p> <p>Year 11: Transport &amp; Excretion Control &amp; Coordination</p> <p>Skills in Biology</p> <p>Year 11: Cell Structure</p>
<b>Unit 3BBIO</b>		
<p><b>Ecosystems: Biodiversity &amp; Sustainability</b></p> <p><b>Conservation</b> Need for conservation. Conservation strategies.</p> <p><b>Continuity of Species</b></p> <p><b>DNA, techniques and technologies</b> DNA replication, protein synthesis. Cloning and genetic modification, recombinant DNA technology, applications of DNA technologies.</p> <p><b>Variation</b> Meiosis and variation. Sources of variation.</p> <p><b>Isolation and selection</b> Barriers to gene flow. Natural and artificial selection, selective pressure.</p> <p><b>Speciation / evolution</b> Gene pools, factors affecting allele frequency.</p> <p><b>Evidence for evolution</b> Evolutionary relationships, evidence for evolution.</p> <p><b>Working as a Biologist</b></p> <p><b>Planning and conducting biological research</b> Design and develop an investigation. Microscopy, SI units, critique a published study.</p> <p><b>Evaluating and communicating as a biologist</b> Limitations and considerations of biotechnology, ability to defend or debate findings, use of biological knowledge to evaluate findings.</p>	<p>Population Dynamics</p> <p>Cellular Processes</p> <p>Reproduction &amp; Development</p> <p>Environment &amp; Adaptation</p> <p>Reproduction &amp; Development</p> <p>Year 12: Inheritance</p> <p>Cell Structure Year 12: The Genetic Code Year 12: Inheritance</p> <p>Skills in Biology</p> <p>Practical Ecology</p> <p>Skills in Biology</p>	<p>Year 11: Human Impact on Ecosystems</p> <p>The Genetic Code Gene Technology Cell Division &amp; Cloning</p> <p>Inheritance Mutations</p> <p>Population Genetics</p> <p>Population Genetics</p> <p>The Evidence for Evolution</p> <p>Skills in Biology Cell Structure</p> <p>Cell Division &amp; Cloning Gene Technology</p>