

Preliminary HSC

Candidates taking the Preliminary HSC course must complete all four core topics and an assessment of practical work. Course material is covered in the workbook in the topics indicated. The

CD-ROM symbol indicates that additional material is available on the Teacher Resource CD-ROM. Weblinks supporting each topic are present throughout, but are not specifically indicated.

HSC Prelim		Topic in Year 11 Workbook	Topic in Year 11 Workbook
Core 8.2: A Local Ecosystem			
1	<ul style="list-style-type: none"> Abiotic characteristics of aquatic and terrestrial environments. Factors determining the distribution and abundance of species in a given habitat. The role of photosynthesis and cellular respiration in ecosystems. The uses of energy by organisms. The general equation for aerobic respiration: summary of a chain of biochemical reactions. 	Environment & Adaptation Population Dynamics Competition & Sociality Nutrition Gas Exchange Nutrition Gas Exchange Chemiosmosis	
2	<ul style="list-style-type: none"> Trends in population estimates of species. Factors affecting numbers in populations of predators and prey. Interactions between organisms: allelopathy, parasitism, mutualism, and commensalism. Role of decomposers in ecosystems. Trophic interactions: food chains, food webs, pyramids of biomass and energy. Adaptation and problems associated with inferring characteristics of organisms as adaptations for living in a particular habitat. Adaptations of plants and animals to factors in their environment. The short and long-term consequences on the ecosystem of resource competition. The impacts of humans on ecosystems. 	Population Dynamics Population Dynamics Predators & Prey Communities Communities Communities Cave Food Webs Environment & Adaptation Adaptation & Fitness Environment & Adaptation Communities Changes in Ecosystems	
Core 8.3: Patterns in Nature			
1	<ul style="list-style-type: none"> Cell theory. Organelles as seen under light and electron microscopes. Structure and function of cellular organelles. 	Cell Structure	
2	<ul style="list-style-type: none"> The major groups of substances in living cells and their uses in cell activity. The structure and role of cell membranes. Diffusion and osmosis. Surface area to volume ratio and its significance to cellular transport rates. 	Cell Structure Cellular Processes Cellular Processes Osmosis & Water Potential Cellular Processes	
3	<ul style="list-style-type: none"> Structural and functional relationships between cells, tissues, organs and organ systems in multicellular organisms. Autotrophs versus heterotrophs. Requirements of photosynthesis. Role of photosynthesis in ecosystems. The general equation for photosynthesis. Plant structures required for obtaining water and minerals. The relationship between leaf shape, the distribution of leaf tissues, and their role. The role of teeth. Dental adaptations. Comparison of the digestive systems of carnivores and herbivores. 	Cellular Processes Nutrition Nutrition Nutrition Transport and Excretion Nutrition Transport and Excretion Nutrition Nutrition	
4	<ul style="list-style-type: none"> Gas exchange surfaces in multicellular animals (insects, frogs, fish, and mammals). Comparison of the roles of the respiratory, circulatory and excretory systems. The relationship between the needs of cells and the need for a transport system. Transport systems in plants (root hairs, xylem, phloem, stomata and lenticels). Comparison of open and closed circulatory systems using vertebrate and invertebrate examples. 	Gas Exchange Gas Exchange Transport & Excretion Transport & Excretion Transport & Excretion	
5	<ul style="list-style-type: none"> The process and role of mitosis. The sites of mitosis in plants, insects, and mammals. The need for cytokinesis in cell division. DNA locations in the cell. 		Cellular Processes Cellular Processes Cellular Processes
Core 8.4: Life on Earth			
1	<ul style="list-style-type: none"> Conditions on primeval Earth and the origin of organic molecules. Miller-Urey experiments. 		The Origin and Evolution of Life
2	<ul style="list-style-type: none"> Fossil formation and the fossil record. The major stages in the evolution of life. 		The Origin and Evolution of Life
3	<ul style="list-style-type: none"> Features of bacteria, including the Archaea, Eubacteria, Cyanobacteria, nitrogen-fixing bacteria, methanogens, and deep-sea bacteria. 		The Principles of Classification Classification Practical
4	<ul style="list-style-type: none"> Principles of classification. Selection criteria used in various classification systems. Technology and the revision of classification schemes. Binomial nomenclature and dichotomous keys. Classification of extinct species. 		The Principles of Classification The Origin & Evolution of Life
Core 8.5: Evolution of Australian Biota			
1	<ul style="list-style-type: none"> Continental drift. Evidence for Australia once being part of Gondwana. Evolutionary relationship between Australia's extinct megafauna and extant species. 		The Evolution of Australia's Biota Continental Drift
2	<ul style="list-style-type: none"> Changing environments in Australia and the relationship of this to the evolution of the Australian flora and fauna. Changes in the distribution of Australian species, as indicated by the fossil record. Current theories accounting for these changes. Adaptations of Australian flora and fauna to cope with variations in climate and resources. 		The Evolution of Australia's Biota Environment & Adaptation Communities Changes in Ecosystems
3	<ul style="list-style-type: none"> Mitosis and meiosis in reproduction and development. External and internal fertilisation. Mechanisms found in Australian flora for pollination, seed dispersal, and asexual reproduction. Mechanisms found in Australian fauna for fertilisation and survival of offspring. 		Reproduction & Development Reproduction & Development Environment & Adaptation Reproduction & Development
4	<ul style="list-style-type: none"> Predicting the impact of human activity on ecosystems and using past studies to predict possible future environments and the survival or extinction of species. The need to maintain biodiversity. 		The Evolution of Australia's Biota Changes in Ecosystems Human Impact on Ecosystems The Evolution of Australia's Biota
Practical Work			
	<ul style="list-style-type: none"> Biological drawings, experimental design, field studies, collection of primary data, handling and analysis of primary and secondary data, and scientific reporting. 		Skills in Biology Practical Ecology Reliability of the Mean Non-linear Regression Linear Regression Analysis of Variance