

# Mangroves in focus 2nd edition syllabus match

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## Subject matter and suggested learning experiences

Key concepts / elaboration	Learning experiences	Pages	KU	IA	EC
MB1.1, 1.2, 1.3, 1.4, 1.5 Biodiversity and the variety and abundance of life in a magrove ecosystem, is an indication of the health of a marine environments. Mangroves are classified according to a range of characteristics which provides a framework for the naming and identification of species. Mangroves are classified according to levels (e.g. kingdom, phylum, class, order, family, genus and species) and the different phyla of Kingdom Plantae contain distinct anatomical and physiological structures, which are observed through dissection.	Describe the distribution and abundance of Australian mangroves to determine the health of a local marine environment. Use keys to identify biodiversity of mangroves in a local area. Use field equipment to identify bacteria, plankton, crabs, fish and other local species found in mangroves.  Identify cells, tissues and organs in a local magrove species as a result of leaf and root crosssectional microcopic analysis. Draw mangrove leaf and pneumatophote cross sections, identify cell types and estimate cell size. Describe methods used to make and observe and identify transverse sections and cell types and distinguish between species. Evaluate methods used suggesting improvements to laboratory techniques	5-42  43-74	✓  ✓	✓  ✓	✓  ✓
MB1.6 Field guides and identification keys use scientific and common names to classify organisms according to distinct and observable features.	Use a variety of keys to identify local mangroves. Design a key to identify mangroves in a local area.	36-42	✓	✓	
MB2.1, 2.2, 2.4 The interactions of marine organisms with biotic and abiotic factors of habitats impact on adaptations . Adaptations are classified as anatomical (structural), physiological (functional) or behavioural.	Evaluate the composition of potting mix and the success growth rate in mangroves. List variables associated with experiment and evaluate control methods. Examine mangrove leaf and epidermal sections, salt secretion, seedling germination rates, salt leaf levels, leaf width and length ratios, leaf angles in relation to sun azimuths to determine and describe anatomical, physiological and behavioural adaptations.	43-74	✓	✓	✓
MB3.1, 3.2, 3.3, 3.4, 3.5 Mangrove ecology is the study of abiotic and biotic factors observed through field study techniques and organisms live in a variety of habitats, which may be classified according to these factors. Organisms in food webs interact via relationships and consumer levels as energy cycles through food webs . Marine organisms interact and populate habitats in various ways throughout the stages of their life cycle. Mangrove ecosystems interact through estuaries, with species adapting to environmental conditions	Determine mud salinity and organic component of the mud. Investigate ecological succession by transect and field methods and record biotic and abiotic factors influencing mangrove distribution. Describe interactions in mangrove ecosystems.  Students undertake projects to investigate attaching organisms, mangrove decomposition, mud saturation, snail populations to determine possible food webs, pneumatophore distribution as it relates to abiotic factors, stages of life cycle development through planktonic analysis, mangrove zonation and biomass, determine mangrove productivity, water quality, growing mangroves, insect repellent.	75-102  32-41, 68-74, 86-102	✓  ✓	✓  ✓	✓  ✓
MS 1.2, 1.6, 2.1, 2.6 Collect primary and secondary data relating to water quality, population density and distribution along transects and record data found in quadrats. Use sampling devices to gather evidence of the distribution and abundance of various organisms. Investigate mangrove environments using field techniques to record the abiotic and biotic features of marine environments. CS3.2 Use methods and devices to collect data relating to water quality and population density and distribution.					
CS2.1, 2.4, 2.5, 2.6 Sustainable management practices, economic and ecological, are shaped by the environmental philosophies of stakeholders. Increases in population density of coastal areas impact on the health of coastal water and should be carefully managed for sustainable outcomes Land management practices contribute to the health of marine ecosystems Education of stakeholders is essential to encouraging sustainable management practices  CS3.6 Decision making involves the consideration of a range of stakeholders' views and a range of alternative pathways for action.	Describe economic value of mangroves, threats to mangroves and management issues. Students undertake projects to investigate mangrove water quality, marine development, effects of canals on mangrove environments, a conservation role play and or conduct a attitudes and feeling poll on mangrove education being essential to encouraging sustainable management practices.	103-132	✓	✓	✓

## Assessment – lab exercises and projects

Notes: Assessment is based on the verbs used in the questions. It is up to the school to set the emphasis on assessment.

Lab exercise	Title	Verbs used in questions	Project	Title	Verbs used in questions
<b>Chapter 1: Classification and biodiversity</b>					
1.1	Mangrove microbes	Sketch, identify, summarise, discuss, explain	1.1	Fish and mangroves	Describe, compare, identify, summarise, suggest, draw
1.2	Scat analysis	Describe, identify, summarise, suggest	1.2	Organisms that live in the mud	Identify, draw, explain, summarise, describe, evaluate, illustrate
			1.3	Mangroves and plankton	Identify, refer, expound, justify, quote, find
			1.4	Mangrove identification	Identify, use a key
			1.5	Crab ID	Identify, estimate, verify, describe, determine, summarise
			1.6	Design a key	Prove, present, evaluate
<b>Chapter 2: Anatomy, physiology and adaptation</b>					
2.1	Mangrove leaf sections	Identify, sketch, estimate, explain, evaluate	2.1	Seedlings and salinity	Compare, identify, explain
2.2	Mangrove leaf epidermis	Identify, sketch, estimate, compare.	2.2	Fruit germinating and salinity	Draw, describe, explain, suggest
2.3	Salt secretion	Identify, describe, determine	2.3	Leaf angles	Compare, evaluate, hypothesise
2.4	Pneumatophore morphology	Sketch, describe, explain, justify, summarise	2.4	Width and length ratios	Compare, describe, propose, hypothesise. justify
2.5	Salt levels in leaves	Indicate, compare, describe, evaluate	2.6	Salt excretion rates	Determine, compare expound
<b>Chapter 3: Ecology and succession</b>					
3.1	Mud salinity	Describe, draw, compare	3.1	Mangrove productivity	Record, calculate, write, report
3.2	Organic component of the mud	Draw, compare	3.2	Ecological succession	Draw, refer, explain
			3.3	Investigating attaching organisms	Identify, compare, evaluate
			3.4	Mangrove leaf decomposition	Complete, draw, explain, calculate
			3.5	Mud saturation	Determine, compare, contrast, hypothesise
			3.6	Pneumatophore distribution	Calculate, compare, justify, account for
			3.7	Leaf fall and biomass	Calculate, describe, indicate, investigate
			3.8	Mangrove snail & crab populations	Calculate, discuss, explain, tabulate
<b>Chapter 4: Conservation and sustainability</b>					
4.1	Mangrove water quality	From aquaculture book	4.1	Marina development	Describe, account for, identify, determine, suggest
4.2	Growing mangroves	Evaluate, list, describe	4.2	Effects of canals	Summarise, evaluate
4.3	Make your own insect repellent	Evaluate, discuss	4.3	Organise a conservation role play	Evaluate, compare, discuss
			4.4	Maine paints and organisms	Compare, discuss, determine, calculate
			4.5	Attitudes and feelings poll	Compare, tabulate, discuss