

LIVING ON THE COAST - PLANT ADAPTATIONS, LIFE IN THE EXTREMES AND MARINE MOLLUSCS

Through research students will gain an understanding of adaptations, in particular adaptations of coastal plants and molluscs found on rocky shorelines.

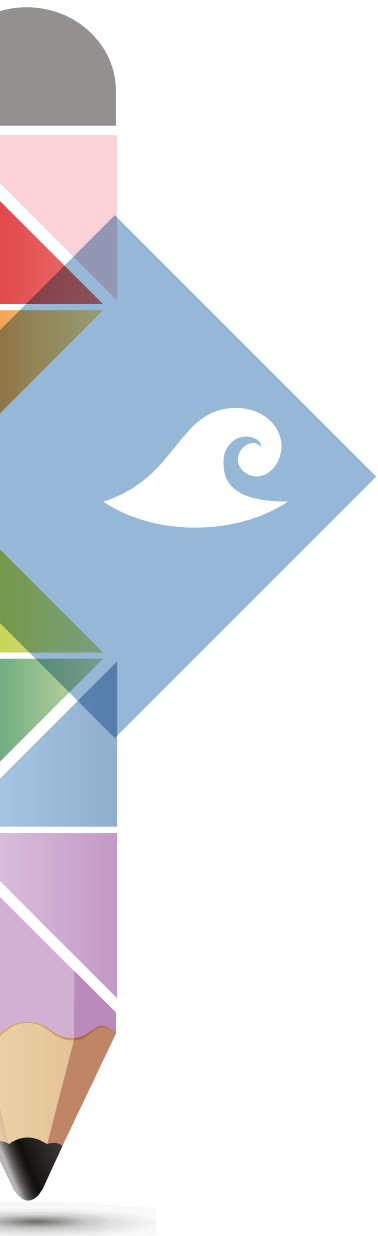
Science Understanding – Biological Sciences

Year	Content Description	Elaborations	Teaching Points
Four	<p>Science Understanding/ Biological Sciences Living things, including plants and animals, depend on each other and the environment to survive. ACSSU073</p>	<ul style="list-style-type: none"> Investigating the roles of living things in a habitat. 	<ul style="list-style-type: none"> The role dune plants play in establishing and stabilising dunes. Dune plants provide shelter for animals.
Five	<p>Science Understanding/ Biological Sciences Living things have structural features and adaptations that help them to survive in their environment. ACSSU043</p>	<ul style="list-style-type: none"> Explaining how particular adaptations help survival such as nocturnal behaviour and silvery coloured leaves of dune plants. Describing and listing adaptations of living things suited for particular Australian environments. Exploring general adaptations for particular environments such as adaptations that aid water conservation in deserts (or coastline). 	<p>As above +</p> <ul style="list-style-type: none"> Three types of adaptations: <ul style="list-style-type: none"> structural; behavioural; and functional. Structural adaptations of dune plants. Characteristics of beach environment: <ul style="list-style-type: none"> strong winds; salt winds; heat; poor nutrient soil; and rocky and sandy ground – difficult to hold on to with roots. Structure of the limestone shoreline – zonations. Adaptations of plants and animals of limestone rocky shorelines.

Geography

Year	Content Description	Elaborations	Teaching Points
Six	<p>Science Understanding/ Biological Sciences The growth and survival of living things are affected by the physical conditions of their environment. ACSSU094</p>	<ul style="list-style-type: none"> Investigating how changing the physical conditions for plants impacts on their growth and survival such as salt water, use of fertilizers and soil types. Researching organisms that live in extreme environments such as Antarctica a desert or coastline. 	<p>As above +</p> <ul style="list-style-type: none"> Fair testing – test one variable at a time, controlling variables. Accurate methods for collecting data and measuring.
Seven	<p>Science Understanding/ Biological Sciences There are differences within and between groups of organisms; classification helps organise this diversity. ACSSU111</p>	<ul style="list-style-type: none"> Grouping a variety of organisms on the basis of similarities and differences in particular features. Using scientific conventions for naming species. Using provided keys to identify organisms surveyed in a local habitat. 	<p>As above +</p> <ul style="list-style-type: none"> Binomial nomenclature (two name system). Protocols for writing scientific names e.g. italics or underlined. Specific coastal plant groups e.g.: <ul style="list-style-type: none"> <i>Spinifex</i>; <i>Acacia</i>; and <i>Scaevola</i>. Focus on Phylum Mollusca: <ul style="list-style-type: none"> define mollusc; examples; and adaptations.





- **Worksheet: Living on the Coast:**
Plant Adaptations can be supported by the use of:
 - Images of local coastal plants;
 - live specimens of coastal plants; and
 - BBC, 2013, *Nature Wildlife: Animal and plant adaptations and behaviours*, <http://www.bbc.co.uk/nature/adaptations> - this website has excellent short snippets of video.
- **Science Inquiry Skills:**
Investigations of ideas
 - Test how different levels of fertilizer OR salt OR wind OR water OR soil type affects the growth of a seedling.
 - It is important that each group test only ONE variable. This is the Independent Variable (the factor being tested).
 - Results need to be collected accurately, preferably at the same time each day. The data (e.g. growth) is the Dependent Variable (the factor being measured).
 - All other factors should be kept the same for each seedling. These are the Controlled Variables. For example; same amount of water, same environment (all on the same window sill), same type of plant, same amount of soil, same type of pot. It does not matter if the seedlings have different heights at the beginning – as long as you measure an original height.
 - Water holding capacity of different soil types.
 - USDA, no date, *Exploring Soils*, <http://forces.si.edu/main/pdf/9-12-ExploringSoils.pdf>
You may want to adapt this to suit your students. Best results are achieved when the soil samples are dry. Damp or wet soil will affect the results.
- **Worksheet – Life in the Extremes**
 - Looks at the limestone rocky shoreline as an extreme environment. This type of landform is found all along the Western Australian coastline.
 - Students will need some help with internet research techniques.
 - Activities on the ‘Water Cycle’ are available in the Adopt a Bushland resource package.
 - Extension- research how tides are formed.
- **Worksheet– Marine Molluscs**
 - Aimed at Year Sevens as it covers classification.
 - Supports ‘Life in the Extremes’ worksheet.
 - Students may need some help with internet research techniques.

References

- ABC, 2010, *Gardening Australia Fact Sheet Spinifex*, <http://www.abc.net.au/gardening/stories/s3083121.htm>
- Dixon, K., 2011, *Coastal Plants*, CSIRO Publishing, Perth, Western Australia.
- Government of Western Australia, no date, *Perth Beachcombers Education Kit*, <http://beachcombers-kit.fish.wa.gov.au/>
- Red Apple Education Ltd, 2013, *Skwirk Interactive Schooling: Adaptations*, www.skwirk.com.au/p-c_s-4_u-200_t-560_c-2091/adaptations/nsw/adaptations/ecology/interactions
- University of Western Australia, 2012, *Adaptations 4: Surviving Extremes* (fact sheet), <http://spice.wa.edu.au/wp-content/uploads/2012/11/surviving-extremes.pdf>