Geography Life Skills	Sustainable Biomes	Stage 5	**Duration:** 10 weeks
			Detail: 60 hours
(Integrated with English, Mathematics and Science Life Skills)			Geography 25 hours, English 15 hours, Science 10 hours, Mathematics 10 hours

Unit focus	Key inquiry questions
Students identify the physical features of biomes. They investigate threats to biomes and the effect of those threats on biomes. Students explore factors influencing and affecting farming and food production in Australia and other countries. Students examine how a growing population affects global food security. They use inquiry skills to conduct a geographical inquiry into threats to a specific biome and use scientific knowledge and skills to explore environmental sustainability. Students draw on their mathematical skills to use maps to identify locations of biomes across the world and interpret information and draw conclusions from data displays. Students interpret and compose a range of visual texts when investigating biomes.	- What are biomes? - How are biomes used and altered? - What are the factors affecting food production? - How will the world feed its future population?

Outcomes	Integrated outcomes
Geography **A student:** • recognises features and characteristics of places and environments **GELS-1** • demonstrates an understanding that places and environments change **GELS-2** • explores interactions and connections between people, places and environments **GELS-3** • explores management of places and environments **GELS-5** • collects and uses geographical information for inquiry **GELS-7** • communicates geographical information **GELS-8**	**English** **A student:** • views and responds to a range of visual texts, media and multimedia **ENLS-4A** • explores the ways in which language forms, features and structures of texts vary according to purpose, audience and context **ENLS-10B** • composes, publishes and presents texts appropriate to purpose and audience in a range of contexts **ENLS-11B** • responds to texts in ways that are interpretive and imaginative **ENLS-12C** • responds to and composes texts that explore personal, social and world issues **ENLS-15D** **Science** **A student:** • participates in planning to investigate questions or problems **SCLS-5WS** • participates in an investigation by following a sequence **SCLS-6WS** • collects, records and interprets data and information **SCLS-7WS** • identifies features of the Earth **SCLS-13ES** • investigates some practices used in the effective management of the Earth's resources **SCLS-16ES** • explores the interactions of living things with each other and the environment **SCLS-20LW**

	Integrated outcomes
	Mathematics **A student:** • uses maps and plans in a range of contexts **MALS-34MG** interprets information and draws conclusions from data displays **MALS-37SP**

Geographical concepts	Geographical skills	Geographical tools
The following **geographical concepts** have been integrated into the lesson sequences:	For students following Life Skills outcomes and content, geographical skills and tools may be selected from various points along the continuum as appropriate. The following **geographical skills and tools** are drawn from the continuum and have been integrated into the lesson sequences. Teachers may select additional skills and tools to suit the needs, interests and abilities of their students.	
Place: *the significance of places and what they are like* **Space:** *the significance of location and spatial distribution, and ways people organise and manage spaces that we live in* **Environment:** *the significance of the environment in human life, and the important interrelationships between humans and the environment* **Interconnection:** *no object of geographical study can be viewed in isolation* **Scale:** *the way that geographical phenomena and problems can be examined at different spatial levels* **Sustainability:** *the capacity of the environment to continue to support our lives and the lives of other living creatures into the future* **Change:** *explaining geographical phenomena by investigating how they have developed over time*	**Acquiring geographical information** • develop geographical questions to investigate and plan an inquiry • collect and record relevant geographical data and information, for example, by observing, interviewing, conducting surveys or using maps, visual representations, the media or the internet **Processing geographical information** • represent data in different forms, for example, plans, graphs, tables, sketches and diagrams • interpret geographical data and information, using digital and spatial technologies as appropriate, and identify spatial distributions, patterns and trends, and infer relationships and draw conclusions **Communicating geographical information** • present findings and ideas in a range of communication forms as appropriate	**Maps – M** • large-scale maps, world map, globe, sketch maps • maps to identify location, direction, distance, map references, spatial distributions and patterns **Graphs and statistics – GS** • data tables, pie graphs, column graphs, compound column graphs, line graphs, climate graphs, population profiles, multiple tables and graphs presented on a geographical theme, statistics to find patterns and trends **Spatial technologies – ST** • virtual maps, satellite images **Visual representations – VR** • photographs, aerial photographs, illustrations, flow diagrams, annotated diagrams, multimedia, web tools

Content	Teaching, learning, assessment and resources
English Students: • explore real and imagined worlds through texts ENLS-12C • explore ways in which ideas, information and perspectives are presented in a range of texts ENLS-12C • recognise that texts represent people, places and events ENLS-15D • explore personal, social and/or world issues in texts ENLS-15D	**Novel study** • Throughout the unit, students explore, either individually or as a class, a fictional text that addresses an environmental issue. Students make connections between the issues addressed in the novel and their learning about biomes, uses of biomes, threats to biomes, and food production. ⚓ 🖝 Examples of texts include: *Seeds of Change: Wangari's Gift to the World* by Jen Cullerton Johnson *The Tree Lady: the True Story of How One Tree-Loving Woman Changed a City Forever* by H. Joseph Hopkins, Jill McElmurry *The Garden of Happiness* by Erika Tamar *Fire* by Jackie French *Where the Forest Meets the Sea* by Jeannie Baker *The Story of Rosie Dock* by Jeannie Baker *Chomp* by Carl Hiaasen *Under the Weather: Stories about Climate Change* edited by Tony Bradman
Geography – World biomes Students: • identify different types of biomes in Australia and around the world eg deserts, grasslands • identify the location and distribution of biomes around the world • examine differences in the climate of biomes • explore the distinctive vegetation and animals found in the different biomes **English** Students: • understand how grammatical conventions can shape meaning when composing texts	**What are biomes?** • Students are introduced to examples of biomes found in Australia, such as deserts, grassland, rainforest, savannah. • Students use the internet to gather information about biomes that exist in Australia and around the world. This may include information about where the biome is, what the climate is like, what plants and animals are found there. Information should include climate graphs and statistics, which students view and interpret to determine temperature and precipitation. Students record information about each biome in a variety of ways, for example as a summary, concept map, attribute list grid or other graphic organiser. Students share information gathered and identify the features of each biome. **M GS** ⚙ 🖥 ✝ Useful links: www.ucmp.berkeley.edu/glossary/gloss5/biome/ www.thewildclassroom.com/biomes/ www.blueplanetbiomes.org/world_biomes.htm earthobservatory.nasa.gov/Experiments/Biome/graphs.php www.blueplanetbiomes.org/world_biomes.htm

Content	Teaching, learning, assessment and resources
for a variety of audiences ENLS-10B ***Mathematics*** Students: • identify and describe features of an environment using map/legends (Communicating, understanding) MALS-34MG • draw conclusions on the basis of the information displayed in tables and graphs MALS-37SP	• Students compose descriptive statements about each biome, for example, *the climate in the desert is **hot and dry**; savannas have **large rainfalls** during summer*. 📎 • Students construct a double bubble map or T-chart to compare the vegetation, animals and climate of two biomes. Students compose comparative sentences using the language of comparison, for example, *reptiles cannot be found in tundras, **however,** they can be found in deserts*. ⚙ 📎
Geography – Changing biomes Students: • identify how biomes are used by people to produce food, industrial materials or fibres eg agriculture, mining • investigate threats to biomes eg agriculture, mining, natural hazards, war, salinity, pollution, tourism, hunting, urbanisation • share ideas about the effect of threats on biomes eg reduced biodiversity, habitat destruction, extinction of vegetation and/or animals • explore sustainability strategies that minimise environmental impacts eg reusable strategies, solar energy ***English*** Students: • create simple visual texts to convey a message, eg poster, cartoon, pictorial	**How are biomes used and altered by people?** • Students view a collection of images of biomes and identify different ways people use each biome, for example, aquatic biomes produce marine life that can be eaten, grasslands can be used to grow crops and to raise cattle, forests provide wood for production. Digital images can be sourced from www.worldbiomes.com/default.htm. The following resource also provides useful information about agricultural uses of biomes www.oxfam.org.au/get-involved/how-schools-can-get-involved/classroom-resources/food-4-thought-2/food-4-thought-geography/worksheet-2-which-biomes-are-able-to-produce-food/. **VR** 🖥 ‡ • Students explore reasons why some biomes are better for people to live in than others. The following presentation provides an overview: http://player.slideplayer.com/26/8684080/#. ⚙ • Students investigate one biome to identify the uses of the biome for food or industry. Students create a visual representation of the uses of the selected biome. **VR** ☀ Useful resources include: *Biomes that Produce our Food, Industrial Materials and Fibre* www.piefa.edu.au/units/index.html#910 *Malaysia: develop or die (palm oil plantations in Malaysia)* www.scootle.edu.au/ec/viewing/S6046/index.html *Forest Learning* forestlearning.edu.au/find-a-resource/article/14/plantation-vs-natural-and-softwoods-vs-hardwoods.html *EnviroNorth: Living Sustainably in Australia's Savannas* www.environorth.org.au/windows/all/all_grazing.html • Students explore how biomes can be used to produce fibres, such as wool and cotton. They create

Content	Teaching, learning, assessment and resources
advertisement ENLS-4A • use structures and features of text to engage an audience and sustain their interest, eg creating visual images to accompany a written text, changing the length of an oral presentation to make it more concise ENLS-11B *Science* Students: • explore human activities that negatively affect resources, eg logging, overfishing and destroying habitats SCLS-16ES • recognise ways that Aboriginal and Torres Strait Islander peoples sustain the value of the land, eg through the selective use of resources SCLS-16ES	a simple flow chart to show the process of how biomes are used to create fibres. **VR** ⚙ • Students share ideas about how farming can change a biome and complete a Pros, Cons, Questions table to identify the advantages and disadvantages of farming. ⚙ <table><tr><td colspan="3" align="center">Agricultural use of rainforests</td></tr><tr><td align="center">**Pros**</td><td align="center">**Cons**</td><td align="center">**Questions**</td></tr><tr><td>Used to harvest medicinal plant products.</td><td>Trees have to be cleared for the plantation.</td><td>Can palm oil plantations occur elsewhere?</td></tr></table> The following videos from splashABC (splash.abc.net.au) may provide stimulus for discussion: 🖳 *Diminishing Fish Stocks: Three Points of View* *Banking on the Rainforest* *Veggies in the Desert – I'd Like to See That!* • ***Geographical inquiry:*** Students explore tourism as another threat that can affect a biome. They investigate the impact of tourism on a specific biome, such as Antarctica, central Australia or the Serengetti. Students predict what could happen if the biome was not looked after properly and create a list of strategies that can be used to protect the environment. Individually or in groups, students create a print or media advertising campaign to promote the protection of the selected biome from one or more threats. Students will need to consider audience, purpose, language and textual forms when creating their advertising campaign. This can be supported by the teacher through persuasive language word lists, language clines and guided scaffolds for the advertisement. **VR** ✦ 👆 👬 • Students explore Aboriginal sustainability practices and consider why it is important for Aboriginal people to be involved in the protection of biomes. The following video may be a useful resource: ✋ splash.abc.net.au/home#!/media/525907/indigenous-perspective-on-sustainability
Geography – Changing biomes Students: • investigate threats to biomes eg agriculture, mining, natural hazards, war, salinity, pollution, tourism, hunting, urbanisation • share ideas about the effect of threats on biomes eg reduced biodiversity, habitat	**How are biomes altered by nature?** • Students consider natural hazards that can destroy the environment, for example, droughts, fires, floods. Students construct a cause–effect map to outline the effects of each natural hazard on the environment. Images showing the impact of natural hazards may be used as a stimulus. ⚙ • Students investigate a specific hazard that has occurred in a biome in Australia, for example, bushfires in a forest biome such as the Blue Mountains; floods in a desert biome such as outback NSW. Using stimulus materials such as firsthand experience, news reports and satellite images, students explore positive and negative impacts of the hazard on animals, vegetation and the local residents. **ST** ⚙ 👆

Content	Teaching, learning, assessment and resources
destruction, extinction of vegetation and /or animals ***Science*** Students: • describe the effects of droughts and floods on the local landscape SCLS-14ES ***English*** Students: • use structures and features of text to engage an audience and sustain their interest, eg creating visual images to accompany a written text, changing the length of an oral presentation to make it more concise ENLS-11B	• Using an online tool such as StoryJumper (www.storyjumper.com) or Storybird (www.storybird.com), students create a picture book explaining the effects of a hazard on a selected biome. Jeannie Baker's *Window* or *Where the Forest Meets the Sea* could be used as a stimulus and to model the language features and structure of a picture book. This could be completed as a class or group activity, with each student contributing to one page in the book. **VR**
Geography– Food production Students: • identify types of farming eg grain, meat, dairy, vegetable, fruit, nut sugar cane • recognise the location and spatial distribution of farming across the world • investigate environmental factors influencing food production eg climate, soils, topography, rainfall • explore environmental challenges to food production eg changing weather patterns, insect plagues, natural hazards, water scarcity, climate change ***Science*** Students: • investigate the needs of living things as they grow, eg the effect of light and water	**What are the factors affecting food production?** • Students view a series of images of different types of farming around the world and identify the food produced in each example. The following resource provides some examples: **VR** education.nationalgeographic.com/education/encyclopedia/agriculture/?ar_a=1 • Students view one or more global agriculture maps to explore where farming, such as crops, are located. Students identify continents that contribute the most to global agriculture and suggest reasons for this. gisgeography.com/agriculture-maps-global-farming/ **M** • Students brainstorm what crops need in order to grow. Students work in small groups to conduct a controlled investigation of the factors that influence the growth of a specific food crop, such as wheat, bean sprouts, fruits or vegetables. Factors that may be investigated include amount of light, temperature, soil (pH level, composition, water solubility) and amount of water. Students participate in gathering and presenting results using diagrams, tables and graphs as appropriate and draw simple conclusions from the investigation. With assistance, students relate the results of their investigation to environmental factors influencing food production, such as climate, soil, topography and rainfall. **GS** • Students consider other challenges to food production, such as natural hazards, insects, climate change and fresh water supplies. Individually or as a class, students explore how one specific challenge has affected food production in a specific location.

Content	Teaching, learning, assessment and resources
on plants SCLS-20LW Students plan investigations by: • recognising variables to be changed, kept the same and measured in an investigation SCLS-5WS Students conduct investigations by: • working individually and/or collaboratively to participate in an investigation SCLS-6WS • recording observations and measurements, using appropriate units and abbrevations SCLS-6WS Students process and analyse data and information by: • drawing conclsuions from data and information gathered in an investigation SCLS-7WS	
Geography – Food for future populations Students: • explore population growth rates in Australia • compare Australia's population growth with that of a country with a rapidly growing population • share ideas about how future population trends may affect food supplies in the future • explore ways food shortages can be addressed eg household or community vegetable gardens, technological advancements	**How will the world feed its future population?** • Students use selected data provided by the teacher to explore the population of Australia. Students respond to the question: What does the data show is happening to the population of Australia? **GS** 📄 Data can be selected from the following links: www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1301.0~2012~Main%20Features~Population%20size%20and%20growth~47 www.indexmundi.com/g/g.aspx?c=as&v=24 www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BriefingBook44p/AustPopulation blog.id.com.au/2015/population/australian-demographic-trends/australias-population-growth-steady-nsw-booming/ Students view the following data source to explore global population rates to determine how the population growth rates of other countries compare with Australia. www.indexmundi.com/g/r.aspx?v=24 Students compose comparative statements using modality to describe global population, for example, *Lebanon had the **highest** population growth rate in the*

Content	Teaching, learning, assessment and resources
Mathematics	world in 2014, Iraq's population growth in 2014 was **double** that of Australia's. **GS** 🦜▯
Students:	• Students discuss how future population trends may affect food supplies. **GS**
• interpret information presented in tables and graphs to answer questions, eg 'The columns show that there are more boys than girls', 'Swimming is the most popular sport among students in our class' MALS-37SP	• Students explore various ways food shortages can be addressed through either community action, such as household and community gardens, or technological advancements, such as minimising food waste, managing pests and drought tolerance. Students compose either: **VR** 🖥👫🦜
English	○ a persuasive visual text for a campaign aimed at encouraging people to plant household or community gardens
Students:	or
• use structures and features of text to engage an audience and sustain their interest, eg creating visual images to accompany a written text, changing the length of an oral presentation to make it more concise ENLS-11B	○ an informative visual text on how science and technology can be used to respond to global food shortages.
	Online tools, such as Lucidpress (www.lucidpress.com), can be used to provide a template for students to construct their texts.
	Useful websites include:
• select and use a range of technology and strategies to create visual and multimedia texts for particular purposes, contexts and audiences, eg picture books, advertisements, illustrations, cartoons ENLS-11B	*Household and community gardens*
	www.cityofsydney.nsw.gov.au/community/participation/community-gardens
	www.camden.nsw.gov.au/community/participation/community-gardens/
	www.communitywebs.org/HCG/photos.php
	Technological advancements
	www.livescience.com/2475-radical-science-aims-solve-food-crisis.html
	fortune.com/2015/05/01/how-tech-can-stop-the-looming-food-crisis/
	www.greenbiz.com/blog/2014/02/25/new-report-emerging-agriculture-technology

Assessment Overview

Assessment as Learning Students will have opportunities to monitor their own learning, ask questions and use a range of strategies to decide what they know, and what they can do, and how to use assessment for new learning. Teachers should encourage student self-reflection and provide students with a variety of ways to reflect on their learning, for example, "This week I have learned….."

Assessment for Learning Teachers collect ongoing assessment data throughout the unit, including student observation and work samples, to assess students' achievement of outcomes. Data collected should be used to make decisions throughout the unit in regards to the level of activity offered to a student and adjustments or support required for future teaching and learning activities. Assessment opportunities should be adjusted to meet the needs of students and take into account individual communication strategies.

Assessment of Learning Achievement of outcomes can be assessed at key points throughout the unit using students' responses to teaching and learning activities.