Living Things in Built Environments | Stage 2 | Science, Technology, Mathematics, English, Geography, PDHPE

Summary	Duration
This unit focuses on learning, through a collaborative, inquiry-based approach, about living things and their environments and how zoos have adapted and changed to support and promote the conservation of animals. By the end of this unit, it is expected that students are able to demonstrate their understanding of what living things need in order to survive, by creating an animal enclosure that reflects their natural environment within a built environment.	Term 2 5 weeks

Key inquiry questions

What do living things need in order to survive?

How have humans adapted environments to conserve endangered species?

Outcomes

Science K-10 (inc. Science and Technology K-6)

- ST2-14BE describes how people interact within built environments and the factors considered in their design and construction
- ST2-1VA shows interest in and enthusiasm for science and technology, responding to their curiosity, questions and perceived needs, wants and opportunities
- ST2-2VA demonstrates a willingness to engage responsibly with local, national and global issues relevant to their lives, and to shaping sustainable futures
- ST2-3VA develops informed attitudes about the current and future use and influence of science and technology based on reason
- ST2-4WS investigates their questions and predictions by analysing collected data, suggesting explanations for their findings, and communicating and reflecting on the processes undertaken
- ST2-5WT applies a design process and uses a range of tools, equipment, materials and techniques to produce solutions that address specific design criteria
- ST2-10LW describes that living things have life cycles, can be distinguished from non-living things and grouped, based on their observable features
- ST2-11LW describes ways that science knowledge helps people understand the effect of their actions on the environment and on the survival of living things

Mathematics K-10

- MA2-1WM uses appropriate terminology to describe, and symbols to represent, mathematical ideas
- MA2-3WM checks the accuracy of a statement and explains the reasoning used
- MA2-17MG uses simple maps and grids to represent position and follow routes, including using compass directions
- MA2-18SP selects appropriate methods to collect data, and constructs, compares, interprets and evaluates data displays, including tables, picture graphs and column graphs

English K-10

- EN2-1A communicates in a range of informal and formal contexts by adopting a range of roles in group, classroom, school and community contexts
- EN2-2A plans, composes and reviews a range of texts that are more demanding in terms of topic, audience and language
- EN2-3A uses effective handwriting and publishes texts using digital technologies
- EN2-4A uses an increasing range of skills, strategies and knowledge to fluently read, view and comprehend a range of texts on increasingly challenging topics in different media and technologies
- EN2-5A uses a range of strategies, including knowledge of letter-sound correspondences and common letter patterns, to spell familiar and some unfamiliar words
- EN2-7B identifies and uses language forms and features in their own writing appropriate to a range of purposes, audiences and contexts
- EN2-8B identifies and compares different kinds of texts when reading and viewing and shows an understanding of purpose, audience and subject matter
- EN2-9B uses effective and accurate sentence structure, grammatical features, punctuation conventions and vocabulary relevant to the type of text when responding to and composing texts
- EN2-10C thinks imaginatively, creatively and interpretively about information, ideas and texts when responding to and composing texts
- EN2-11D responds to and composes a range of texts that express viewpoints of the world similar to and different from their own
- EN2-12E recognises and uses an increasing range of strategies to reflect on their own and others' learning

Geography K-10

- GE2-1 examines features and characteristics of places and environments
- GE2-2 describes the ways people, places and environments interact
- GE2-3 examines differing perceptions about the management of places and environments

PDHPE K-6

- PDHPE-COS2.1 uses a variety of ways to communicate with and within groups
- PDHPE-DMS2.2 makes decisions as an individual and as a group member
- PDHPE-INS2.3 makes positive contributions in group activities

Content	Teaching, learning and assessment	Resources
Stage 2 - Living World Living things can be grouped on the basis of observable features and can be distinguished from non-living things. (ACSSU044) ▪ sort objects according to whether they are living or non-living ▪ identify some features of living things that distinguish them from non-living things, eg reproducing, growing and responding to stimuli **Stage 2 - Writing and representing 1** Develop and apply contextual knowledge ▪ experiment and share aspects of composing that enhance learning and enjoyment Respond to and compose texts ▪ discuss aspects of planning prior to writing, eg knowledge of topic, specific vocabulary and language features ▪ experiment with visual, multimodal and digital processes to represent ideas encountered in texts	**Success Criteria**: ▪ *I can write a definition* ▪ *I can identify the needs of living things* **Activity:** Inform students that the director of the local astronomical observatory has sent the school a message that he/she thought the students would be interested in. Explain to students that a coded message was received from outer space and the scientists at the observatory were able to decode it. Inform students that the scientists read the message and sent it on to the school for actioning. Display the message from Atto - firstly, the 'coded' part of the message and then read students the translation. This introduces Atto and his mission and what he requires from the students. Show students the image of Atto on his home planet. Explain to the students that Atto has now landed on Earth and has observed some interesting things. He is very excited about some specimens he has already collected and urgently needs assistance in understanding what they are 1. Show students the specimens that Atto has collected. (Provide a few samples of small living things, eg plant, snail and non-living things, eg rock, household item.) Explain that as Atto has only just landed on Earth, he doesn't know anything about these specimens. The students' objective is to examine the specimens and draw diagrams that show their features. This will help Atto to understand the difference between living and non-living things. 2. Inform students that they are to think about whether the specimen they examined is either a living or non-living thing. 3. Model the drawing of a scientific diagram. Explain the following features of a scientific diagram to the students. a) Scientific diagrams are drawn in order to identify features of specimens. These features include colour, shape and texture. b) Measurements can be taken to indicate the accurate size of the specimen. c) Diagrams are labelled and descriptions are given to adequately explain what is being seen. d) Scientific descriptions use factual language not expressive or creative language to describe things. For example, a flower may be described as a yellow flower with rounded petals, not a pretty flower with lovely petals. 4. Inform students that they will make scientific diagrams of each of the specimens. 5. Divide students into groups and distribute the specimens and magnifying glasses to each group. Ask students to choose a specimen to draw. Have students share their diagrams and justify their categorisation of their specimen as living or non-living. (Students could take photographs of each specimen to keep as a digital record for Atto.) 6. Ask the students the following questions. a) Is your specimen a living or non-living thing? Why? b) What features did your specimen have that made you categorise it as living or non-living? 7. Record students' ideas about living and non-living things. Students use these ideas to write a definition of living and non-living things. check dictionary for accuracy. 8. Teacher to create anchor chart of definitions to display https://www.youtube.com/watch?v=zFGydQHh0KA pause at 3:10 and play game with the class.	Message from Atto word doc - in OneDrive Magnifying glasses camera?

Content

Stage 2 - Living World

- identify and use patterns in the observable features of living things to group them, by using tables, diagrams or flowcharts

Stage 2 - Living World

Inquiry question: How can we group living things?

- collect data and identify patterns to group living things according to their external features, and distinguish them from non-living things (ACSSU044)
- identify that science involves making predictions and describing patterns and relationships (ACSHE050, ACSHE061)

Stage 2 - Data 1

Identify questions or issues for categorical variables; identify data sources and plan methods of data collection and recording (ACMSP068)

- recognise that data can be collected either by the user or by others
- identify possible sources of data collected by others, egnewspapers, government data-collection agencies, sporting agencies, environmental groups
- pose questions about a matter of interest to obtain information that can be recorded in categories
- predict and create a list of categories for efficient data collection in relation to a matter of interest, eg'Which breakfast cereal is the most popular with members of our class?'

Collect data, organise it into categories, and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies (ACMSP069)

- collect data and create a list or table to organise the data, eg collect data on the number of each colour of lollies in a packet
  - use computer software to create a table to organise collected data, ega spreadsheet (Communicating)

Teaching, learning and assessment

Success Criteria:

- *I can identify some features to describe a category of animals*

Activity:

What are the observable features of each category of animal?

In groups students research a particular category of animal, come back as whole class and share.

Create class anchor chart to display.

Use anchor chart to create next activity

Success Criteria:

- *I can create a table to display data*

Activity:

Create (in pairs) a table to display the different categories of animals and their observable features eg

Category	***Reptiles***	***Mammals***	***Marsupial***	***Insects***	***Birds***
Features	*Cold blood, scales*	*Give birth to live young*			
Animals	Snake Frill-neck lizard	Whale	Kangaroo	Ant Bee	Penguin

Resources

Laptops- research and table creation Britannica - research Butchers paper - anchor chart

Content	Teaching, learning and assessment	Resources
Stage 2 - Position 1 Create and interpret simple grid maps to show position and pathways (ACMMG065) ▪ describe the location of an object using more than one descriptor, eg 'The book is on the third shelf and second from the left' ▪ use given directions to follow routes on simple maps ► use and follow positional and directional language (Communicating) ▪ use grid references on maps to describe position, eg'The lion cage is at B3' ► use grid references in games (Communicating) ▪ identify and mark particular locations on maps and plans, given their grid references ▪ draw and label a grid on a given map ► discuss the use of grids in real-world contexts, egzoo map, map of shopping centre (Reasoning) **Stage 2 - Built Environments** People interact in varying ways within built environments. ▪ observe how people interact within a built environment and describe how its design meets the needs of the users, eg the ways people use and interact in a local shopping centre or playground ▪ examine some built environments, eg a local playground or shopping centre, and identify some factors that have been considered in the design, such as purpose, access, aesthetic and environmental considerations, and movement within the space describe how the design and construction of a built environment may be modified to better suit the needs of users	**Success Criteria:** ▪ I can give directions to a specific location from the zoo entry point **Activity:** Identify which animals are Australian in the previous lessons table. Highlight all the animals in the list that are available to view at Taronga zoo add any additional animals you did not list. Give directions on how to find a specific animal at the zoo. Use grid references and positional language Extension into Maths Lesson = Create map of school on grid and give directions from key areas in the school for visitors.	Taronga kids map - map use Saved table from previous lesson.

Content	Teaching, learning and assessment	Resources
Stage 2 - Writing and representing 1 ▪ identify key elements of planning, composing, reviewing and publishing in order to meet the demands of composing texts on a particular topic for a range of purposes and audiences ▪ plan, draft and publish imaginative, informative and persuasive texts containing key information and supporting details for a widening range of audiences, demonstrating increasing control over text structures and language features (ACELY1682, ACELY1694) ▪ discuss aspects of planning prior to writing, eg knowledge of topic, specific vocabulary and language features ▪ plan and organise ideas using headings, graphic organisers, questions and mind maps ▪ identify elements of their writing that need improvement and review using feedback from teacher and peers ▪ reread and edit texts for meaning, appropriate structure, grammatical choices and punctuation (ACELY1683) ▪ reread and edit for meaning by adding, deleting or moving words or word groups to improve content and structure (ACELY1695) Stage 2 - Writing and representing 2 Develop and apply contextual knowledge ▪ identify and analyse the purpose and audience of imaginative, informative and persuasive texts ▪ understand how a range of language features can shape readers' and viewers' understanding of subject matter	**Success Criteria:** ▪ I can write an informative text about my favourite animal (Appearance, habitat, diet, behaviour/movement) **Activity:** Choose a favourite animal from the table that can be found at the zoo Research favourite animal using multiple sources (Books, Epic, Britannica etc) Students use informative texts about an animal to record information on a matrix. They use this matrix as a plan to structure and write an information report. Students produce a handwritten draft, which is then redrafted and published using neat handwriting or a computer. Expand this during Writing lessons to teach students how to structure an Informative Text appropriately. Focus on paragraphs, technical language, Heading/subheadings, editing	

Content	Teaching, learning and assessment	Resources
Stage 2 - Writing and representing 1 ▪ plan and organise ideas using headings, graphic organisers, questions and mind maps ▪ experiment with visual, multimodal and digital processes to represent ideas encountered in texts Stage 2 - Working Technologically ▪ exploring design situations and/or existing solutions relevant to the needs and wants of themselves and others ▪ working individually and collaboratively to develop a design brief that identifies simple design criteria relating to requirements that make the proposed solution useful and attractive while having minimal impact on the environment ▪ using creative thinking techniques, including brainstorming, mind-mapping, sketching and modelling ▪ using a range of research techniques to access information relevant to the task ▪ using digital technologies and multimedia for communicating design ideas ▪ reflecting on the process followed and what could be done differently to ensure that the solution meets the needs of the user/audience ▪ using established design criteria to evaluate the process, product or solution, and suggesting how their design solution could be improved	**Success Criteria:** ▪ I can develop an app prototype **Activity:** Students create an app prototype to display their researched animal information so it is suitable for infants/Kindergarten children. This app will be used by kindy to learn about animals before they visit the zoo for an excursion. App prototype can be created in PowerPoint or Google Slides on the laptops or in Keynote on iPad.	Laptop or iPad

Content	Teaching, learning and assessment	Resources
Stage 2 - Living World ▪ identify ways that the environment can affect the life cycle of plants and animals ▪ identify some factors in the local environment that are needed by plants and animals for survival ▪ gather information about some relationships between living things, eg predator-prey, competitors and mutually beneficial relationships ▪ predict the effect of natural changes in the environment on some relationships between plants and animals, eg drought and fire ▪ describe some examples of how science knowledge helps people to understand the effect of their actions on the environment and the survival of living things (ACSHE051, ACSHE062)	**Success Criteria:** ▪ I can identify factors that affect living things in their habitats **Activity:** Explain to students that in order for Atto to understand more about living things on Earth, it is important for him to understand that living things are affected by a number of environmental factors. Ask students to think about the animals they have been observing and to make suggestions about what factors may have affected how these have grown. List responses and ask students to select those factors most likely to affect living things. Explain that the main factors that affect living things are temperature, water and human activity. Discuss ideas such as extremes in temperature, sun or wind exposure, overabundance or lack of water and overactivity by humans. Explain that living things in habitats interact with, and are affected by, each other. Inform students that this activity has them examining the relationship between environmental factors and living things. Inform students that they will be revisiting various schoolyard areas to identify factors that might be affecting the living things in each area. Explain to students that they are to look for areas that show evidence of strong sun exposure, lack of water or overactivity. Revisit each schoolyard area and guide students to identify the factors that are affecting the living things in each area. Have students take photographs to assist in documenting these factors for Atto. Have students nominate the factors that they identified and select the key factors for each area. Ask students to write a report for Atto to include in his mission report. Distribute the worksheet Altos Communication Device for students to document their findings. Remind students to describe any of the relationships between the living things and the environmental factors they have found.	

Content	Teaching, learning and assessment	Resources
Stage 2 - Built Environments People interact in varying ways within built environments. ▪ observe how people interact within a built environment and describe how its design meets the needs of the users, eg the ways people use and interact in a local shopping centre or playground ▪ survey a range of places and spaces in local built environments and identify how people interact within them for a range of purposes for social and cultural reasons, eg use of the local hall for a school play or use of local playing fields for sport ▪ examine some built environments, eg a local playground or shopping centre, and identify some factors that have been considered in the design, such as purpose, access, aesthetic and environmental considerations, and movement within the space ▪ describe how the design and construction of a built environment may be modified to better suit the needs of users **Stage 2 - Living World** Living things, including plants and animals, depend on each other and the environment to survive. (ACSSU073) ▪ identify some factors in the local environment that are needed by plants and animals for survival ▪ predict the effect of natural changes in the environment on some relationships between plants and animals, eg drought and fire ▪ describe some examples of how science knowledge helps people to understand the effect of their actions on the environment and the survival of living things (ACSHE051, ACSHE062)	**Success Criteria:** ▪ I can explore ways to improve biodiversity in our school environment. **Activity:** Inform students that during this lesson they will be showing Atto how to improve the biodiversity of a habitat. Review the terms 'biodiversity' and 'habitat'. Explain to students that in order to improve biodiversity, it is necessary to understand the current conditions of the area you would like to improve. Discuss how there are relationships between the plants in an environment and the animals that live in that environment. Revisit the living thing audit carried out in the previous lesson. Identify and choose the area that requires intervention to improve its biodiversity. Conduct a simple compare and contrast activity (such as a Venn diagram or table) to identify similarities and differences between the 'at risk' area in the school and what it should look like. Ask students to make suggestions about ways they could improve the biodiversity of the chosen area. List responses and nominate actions before prioritising them. (Speak to garden botanical gardens special guest at next visit to offer suggestions about plant species that may provide for improved biodiversity.) Have students make real-life connections to the work they have been doing by having them make recommendations to the school's executive team and principal about what they could do in the school grounds. Explain to students that some of the actions may require permission to be carried out and assistance from other staff to be completed and that is why it is important to inform all the involved parties of the proposal. Inform students they will write a letter to the principal detailing their findings and explaining the strategies chosen to improve the biodiversity in the chosen schoolyard area. Inform students that Atto is now ready to return to his home planet with the reports they have completed for him.	http://easyscienceforkids.com/all-about-conservation/ https://www.natgeokids.com/au/discover/science/nature/conservation-tips/#!/register http://www.biologicaldiversity.org/youth/conservation_for_kids.html https://kids.britannica.com/kids/article/conservation/352993

Stage 2 - Built Environments A range of factors needs to be considered when designing and constructing built environments. ▪ examine some built environments, eg a local playground or shopping centre, and identify some factors that have been considered in the design, such as purpose, access, aesthetic and environmental considerations, and movement within the space ▪ describe how the design and construction of a built environment may be modified to better suit the needs of users **Stage 2 - Working Scientifically** ▪ using curiosity, prior knowledge, experiences and scientific information with guidance, identifying questions in familiar contexts that can be investigated scientifically (ACSIS053, ACSIS064) ▪ suggesting appropriate materials, tools and equipment they could use in conducting their investigations and recording their findings, identifying appropriate safety rules ▪ sharing what they did and found out, including identifying some strengths and limitations of the method they used and what could be done differently to improve their investigation, including fairness as appropriate **Stage 2 - Working Technologically** ▪ exploring design situations and/or existing solutions relevant to the needs and wants of themselves and others ▪ using techniques, including labelled drawings, modelling and storyboarding, for documenting and communicating design ideas ▪ refining ideas in responding to feedback from others ▪ exploring a range of materials appropriate for the task ▪ developing and applying a plan and sequence for production that considers, where relevant, time and resources ▪ safely and correctly using a range of tools and equipment, materials and techniques, eg cutting, combining, joining, shaping, assembling and finishing materials ▪ reflecting on the process followed and what could be done differently to ensure that the solution meets the needs of the user/audience ▪ using established design criteria to evaluate the process, product or solution, and suggesting how their design solution could be improved ▪ reflecting on findings to identify what they could find out next through the processes of Working Technologically and Working Scientifically	**Success Criteria:** ▪ I can explore ways to improve biodiversity for endangered animals **Activity:** Students in groups develop a zoo enclosure appropriate to a researched animal to assist in its survival. Wildlife Conservation 60 Minutes, Kevin Richardson "Lion Whisperer" - https://www.youtube.com/watch?v=Deg439MR3Do Lend Your Eyes to the Wild with Wildlife Witness - https://www.youtube.com/watch?v=pMj1i5AIc00 Conservation in Zoos- https://www.youtube.com/watch?v= JmLGf138zY Taronga Zoo Youtube Channel - https://www.youtube.com/user/TarongaSydney/featured	https://www.instagram.com/tarongazoo/