

# Enclosures and Enrichment

## Unit / Teacher Notes

### What can we offer

At Hamilton Zoo we can provide educational opportunities for students of all levels. This programme promotes awareness of issues relating to the welfare of animals in captivity. Students can observe animal behaviour and use this information to help develop enclosures and animal enrichment.

### Environmental education – Why?

We take a multi-disciplinary approach to learning in environmental education that develops the knowledge, awareness, attitudes, values, and skills that enables individuals and the community to contribute towards maintaining and improving the quality of the environment.

The aims of our environmental education programs are for students to develop:

- awareness and sensitivity to the environment and related issues.
- knowledge and understanding of the correlation between the environment, animals and people.
- attitudes and values that reflect feelings of concern for the environment
- skills involved in identifying, investigating, and problem solving associated with environmental issues.
- sense of responsibility through participation and action as individuals, or members of groups, whānau, or iwi, in addressing environmental issues.

### Key Competencies

**Participating and Contributing** – *students are* given the opportunity to become actively involved in contributing to enhancing the environment in which animals live.

**Using Language, Symbols and Text** - *students will* explore animal behaviour through visual, oral and written text and communicate findings in a variety of formats.

**Relating to others** – *students will* be able to listen actively to each other, recognise different points of view and share ideas in relation to animal enclosures and enrichment.

**Thinking** – *students will* use creative and critical thinking to make sense of observations, information and ideas, which will allow them to design enclosure and enrichment toys.

**Managing Self** – *students will* be self-motivated, follow instructions and complete tasks.

### Values

Innovation, Inquiry and Curiosity *by thinking critically, creatively, and reflectively.*

Participation in the wider community

Respect for themselves, others and animals.

## Possible Learning Areas / Achievement Objectives

(main focus Technology with links to other areas)

### Technology

#### Level 1

##### **Technological Practice – Planning for Practice**

- Outline a general plan for developing an enrichment toy/enclosure for an animal, identifying appropriate steps and resources.

##### **Technological Practice – Brief Development**

- Describe an enrichment toy/enclosure for an animal, identifying attributes it should have, taking account of the need and the resources available.

##### **Technological Knowledge – Technological modelling**

- Understand that functional models are used to represent reality and test design concepts, and that prototypes are used to test technological outcomes.

##### **Technological Knowledge – Technological products**

- Understand that technological products are made from materials that have performance properties.

#### Level 2

##### **Technological Practice – Planning for Practice**

- Develop a plan that identifies the key stages and the resources required to complete an enrichment toy/enclosure for an animal.

##### **Technological Practice – Brief Development**

- Explain the outcome of the enrichment toy/enclosure, taking account of the need and the resources available.

##### **Technological Knowledge – Technological modelling**

- Understand that functional models are used to explore, test and evaluate design concepts, and that prototyping is used to test for fitness of purpose.

##### **Technological Knowledge – Technological products**

- Understand that there is a relationship between a material used and its performance properties.

#### Level 3

##### **Technological Practice – Planning for Practice**

- Undertake planning to identify the key stages and resources required to develop an enrichment toy/enclosure. Revisit planning to include reviews and progress and identify implications for subsequent decision making.

##### **Technological Practice – Brief Development**

- Describe the nature of the enrichment toy/enclosure, explaining how it addresses the need. Describe the key attributes that enable development and evaluation.

## Possible Learning Areas / Achievement Objectives

(main focus Technology with links to other areas)

#### Level 3 continued

##### **Technological Knowledge – Technological modelling**

- Understand that functional models are used to inform decision making, and that prototypes can be used to evaluate the fitness for further development.

##### **Technological Knowledge – Technological products**

- Understand the relationship between a material used and its performance properties.

#### Level 4

##### **Technological Practice – Planning for Practice**

- Undertake planning that includes reviewing the effectiveness of past actions and resourcing, exploring implications for future actions and accessing of resources, taking into consideration stakeholder feedback, to complete a workable enrichment toy.

##### **Technological Practice – Brief Development**

- Justify the nature of designing an enrichment toy. Describe the key attributes identified in feedback, which will inform the development of the enrichment toy and its evaluation.

##### **Technological Knowledge – Technological modelling**

- Understand how different forms of functional models are used to explore possibilities and to justify decision making, and how prototyping can be used to justify refinement.

##### **Technological Knowledge – Technological products**

- Understand that materials can be formed, manipulated, and/or transformed to enhance the fitness for its intended purpose.

#### Level 5

##### **Technological Practice – Planning for Practice**

- Analyse their own and others' planning practices to inform the selection and use of planning tools. Use these to support and justify planning decisions that will see the development of the enrichment toy through to completion.

##### **Technological Practice – Brief Development**

- Justify the nature of designing an enrichment toy. Describe the key attributes identified in stakeholder feedback, which will inform the development of the enrichment toy and its evaluation.

##### **Technological Knowledge – Technological modelling**

- Understand how evidence, reasoning, and decision making in functional modelling contribute to the development of design concepts and how prototyping can be used to justify ongoing refinement.

## Possible Learning Areas / Achievement Objectives

(main focus Technology with links to other areas)

	<p><b><u>Level 5 continued</u></b>  <b>Technological Knowledge – Technological products</b></p> <ul style="list-style-type: none"> <li>• Understand how materials are selected, based on desired performance criteria.</li> </ul> <p><b><u>Level 6/7/8</u></b>  <b>Technological Practice – Planning for Practice</b></p> <ul style="list-style-type: none"> <li>• Critically analyse their own and others' past and current planning practices in order to make informed selection and effective use of planning tools. Use these to support and justify ongoing planning that will see the development through to completion.</li> </ul> <p><b>Technological Practice – Brief Development</b></p> <ul style="list-style-type: none"> <li>• Justify the nature of an intended outcome in relation to the need and justify specifications in terms of key stakeholder feedback and wider community considerations.</li> </ul>
<b><u>Science</u></b>	<p><b><u>Level 1/2/3/4</u></b>  <b>Material World – Properties and Changes of matter</b></p> <ul style="list-style-type: none"> <li>• Observe describe and compare physical properties of common materials.</li> </ul> <p><b>Living World – Ecology</b></p> <ul style="list-style-type: none"> <li>• Recognise that animals are suited to their particular environment.</li> </ul> <p><b><u>Level 5</u></b>  <b>Living World – Ecology</b></p> <ul style="list-style-type: none"> <li>• Investigate the interdependence of living things individually and in an ecosystem.</li> </ul>
<b><u>English</u></b>	<p>Listening, Reading and Viewing</p> <p>Speaking, writing and Presenting</p>
<b><u>Mathematics</u></b>	<p>Statistics, Number, Measurement</p>
<b><u>The Arts</u></b>	<p>Music, Visual Arts</p>
<b><u>Health and Physical Education</u></b>	<p>Movement Concepts and Motor Skills – Science and Technology</p> <p>Relationships with Other People – Interpersonal Skills</p>

## National Standards

This is an ideal unit that can be linked to Reading, Writing and Numeracy National Standards. Choose which way best suits you to include this into an enrichment unit.

**Reading** - expose students to a variety of text (nonfiction, previous enrichment toy/enclosure plans, information on animal behaviour) see resource list on page 10 for examples of reading material suited for this topic.

**Writing** – choose a writing focus to be included in this unit (for example reports, articles, explanation, recounts of process, procedure writing)

**Numeracy** – Statistics, Measurement, Number

## Learning Intentions

- Respect self, others and the environment
- Communicate effectively
- Solve problems efficiently

## Why Enrichment?

Environmental enrichment improves or enhances zoo environments for animals, stimulating them to investigate and interact with their surroundings. We enrich animal environments by enclosure design as well as making changes to structures in their enclosures, presenting novel objects and smells for them to investigate and explore, and by changing how we present food to them. Doing all of these things alleviates boredom by giving animals more choice of activity.

It encourages them to forage, hunt and handle their food in ways that are natural to them in the wild. The traditional method of feeding zoo animals out of a feed pan does little to stimulate complex feeding behaviours. Enrichment keeps zoo animals active and interested in their environment.

For these reasons, enrichment improves animal welfare. It also enhances the public's experience of animals. And, for the endangered species we breed in zoos, enrichment can help reduce stress and promote successful reproduction.

## Examples of Animal Enrichment

- Initial design of enclosures taking into account behaviours you would like to see the animals display
- Keeper conditioning animals to carry out certain tasks
- Toys that encourage animals to hunt for their food
- Adding items in the enclosure to encourage curiosity e.g. furniture
- Adding scents and sounds into enclosures
- Changing outlook and features of enclosures e.g. trees, water hole
- Including new animals into the enclosure (an example of this is the savannah area)
- Modifying diet, the way they are fed, positions they are fed

## Possible Learning Experiences

- Investigate the connectedness of the environment and an animal.
- Recognise some ways in which zoos are enhancing the environment for animals. What enrichment is already been carried out? Write a report on this.
- Develop observational skills and be able to report findings in either a written or verbal format.
- Carry out a process to design an enclosure/enrichment toy for a given animal, making sure you have taken into account information from keepers' information gathered and/or observation.
- Construct an enrichment toy that you have designed either as a class/group or individually. Remembering that most technological devices need to be tested and re-designed to make the final product more durable and meaningful.
- Record the procedure taken to design and make an enrichment toy, taking into account accurate measurement so that the toy can be reproduced.

## Key Concepts / Big Picture

- Everything has a place on earth and zoos have the role in protecting habitats and species.
- There is a correlation between us and animals. Our actions can contribute to the environment in which animals live.

## Vocabulary

Enrichment, behaviours, physiological, psychological, enclosure, environment, scents, training, stimulate, enhancement, foraging, prototype, modify, observation, habitat, construction, design, captivity.

## Possible Assessment / Success Criteria

- Describe the process you have taken to construct an enrichment toy.
- Explain why it is important for animals that live in zoos to have a positive environment to live in.
- Be able to match enrichment toys that would be appropriate for certain animals.
- Identify actions that Hamilton Zoo has already taken to enhance their animals' environments.
- Construct an enrichment toy that you have designed and explain why this design has (or has not) worked.

## Pre-visit Learning

- Discuss what we already know about the animal we will be observing. This could then be reinforced in the zoo classroom prior to observing animal.
- Discuss what enrichment is and what they think they might see in an animal enclosure.
- What ideas for enrichment do you already have?
- What types of questions would be important to be answered by zoo staff before starting to design an enclosure/enrichment toy?

## Learning at the Zoo

### Have an education lesson in the zoo classroom and:

- learn about a particular animal and its environment both naturally and in the zoo.
- look at different enclosure designs and what materials are used.
- look at enrichment toys up close. How do they work?

### With a walk around the zoo

- Observe animal behaviour and how do they use the environment within their enclosure.
- Identify enrichment in different enclosures
- Observe an animal and record what is important to know before designing an enrichment toy. (e.g. if it needs to be hung... is there somewhere to hang it?)

## Post-visit Learning

- Use information gathered at the zoo to follow a design procedure for an enclosure/enrichment toy. Taking into account available resources.
- Carry out an individual, group or class inquiry to come up with an enrichment toy that will be able to be presented to the zoo (would be good to re-visit the zoo to see this enrichment toy tested). Brainstorm ways for improvement.
- After observing an animal design a model of an animal enclosure making sure all aspects of their behaviour has been accounted for.



## Suggested Enclosure/Enrichment Inquiry Unit

Inquiry Questions	Activity	Teachable moments
What do we know about how animals live in zoos?	Get students to brainstorm what they already know about how animals live in the zoo. Is this the same as if they were in the wild? What is the same/different? Are all zoos the same? Is each enclosure for different animals the same? Record what students know.	<ul style="list-style-type: none"> <li>- How do we brainstorm?</li> <li>- Working collaboratively – we can learn a lot from what others know.</li> </ul>
What would we like to find out about animal environments at the zoo / in the wild?	Get students to come up with a list of questions they would like to find out about enclosures in which animals are housed at the zoo? This could be done as a class, in groups or individually. Group these questions into categories. E.g. natural environment (trees, grass area etc.), feeding, play, sleeping, interaction with other animals.	<ul style="list-style-type: none"> <li>- How do we ask a good question? – Open /closed questions.</li> </ul>
What is Enrichment?	Explain what enrichment is to students. This may be in the form of diagrams, worksheets or photos. Look at the different animal enrichment that has been designed for certain animals. Now that they know a little more about enrichment are there any more questions that they could add to their questions list. Have any of their questions been answered? Come up with a class definition of what enrichment is. E.g. Enrichment is.....	<ul style="list-style-type: none"> <li>- Looking at different resources to gather information. E.g. books, internet, people, libraries, zoos etc.</li> <li>- How do we sum up all the information we now know.</li> </ul>
What type of enrichment do humans need? What would it be like if we had none?	Look at a day in the life of a child at school. What types of things are put in place to make the environment enriching for us as kids? Why is it important for us to have these? What would it be like if we were only allowed to sit on the carpet each day with our arms and legs folded? What do teachers do to make school a little more interesting?	<ul style="list-style-type: none"> <li>- Understanding enrichment from a human perspective.</li> </ul>
Big Question	With all the questions that we have come up with is there a way that we can make this into a 'Big Picture' question? This could explain the process that we are going to take to come up with a final product. It may need a bit of guidance from the teacher if HOT questioning has not been covered. E.g. Explain what animal enrichment is and why it is important, examine the natural behaviour and characteristics of an animal and design and construct an animal enclosure/enrichment prototype to encourage the animals' natural behaviour and prevent boredom when it is in captivity.	<ul style="list-style-type: none"> <li>- Higher Order Thinking Question</li> </ul>

## Suggested Enclosure/Enrichment Toy Inquiry Unit

Inquiry Questions	Activity	Teachable moments
Understanding a bit about animals in zoos.	Introduce students to some of the animals they will find at their local zoo. What animal/s do you think might need enrichment? What might some of this enrichment look like? Can a bird use the same enrichment as a chimpanzee? Some students may have already done some research and have more to offer. Choose one animal they would like to design an enclosure or enrichment for.	<ul style="list-style-type: none"> <li>- Being able to explain/draw a design they are visualising.</li> <li>- Understanding how different animals have different behaviours.</li> <li>- Researching</li> </ul>
What can enrichment be made from?	Visit to the Hamilton Zoo. Have a close look at enclosures and enrichment that is used at Hamilton Zoo. How and what is it made of? How does it work? What animal would it best be suited and why? Could it be made from another product? Why/ why not? How is it placed within the animals' environment?	<ul style="list-style-type: none"> <li>- Research skills</li> <li>- Using prior knowledge</li> <li>- Identification of materials</li> <li>- Logic and Reasoning</li> </ul>
Observation of an animal and its enclosure.	<p>It is best to choose just one animal at the zoo to study. Chimpanzee, kea, meerkat and monkeys are the most common places you can see an enrichment put into practice. Things we need to know about an animal before we can design enrichment.</p> <ul style="list-style-type: none"> <li>- What can your animal do/not do?</li> <li>- What is the zoo habitat that they live in? Does it have trees, water etc.?</li> <li>- Who lives with your animal?</li> <li>- What does your animal like to eat? How do they eat? Do they use hands/fingers or noses?</li> <li>- How does your animal move around?</li> </ul>	<ul style="list-style-type: none"> <li>- Field Trip</li> <li>- Observation of animal and environment</li> </ul>
Observation of behaviour	<p>How is your animal behaving around other animals? What is the reason for this behaviour? E.g. playing together, fighting, hiding, making noises</p> <p>Does this behaviour change when new enrichment is introduced? This would be a great opportunity for the children to be exposed to a keeper talk where enrichment is introduced.</p>	<ul style="list-style-type: none"> <li>- Field Trip</li> <li>- Observation of behaviour and how this changes</li> </ul>

## Suggested Enclosure/Enrichment Toy Inquiry Unit

Inquiry Questions	Activity	Teachable moments
Design Criteria	What are we going to do with all this information we have gathered? Can we come up with criteria for our design? As a group, children could come up with their own enclosure or enrichment designs. Sketch their ideas and present to the group. Critique designs noting the bits that will work and those that will not. Pull ideas together to come up with a modified design. Do we need to do more research? (costs, materials etc.).	<ul style="list-style-type: none"> <li>- Processing Information</li> <li>- Criteria – what does that mean?</li> <li>- Sketching</li> <li>- Critiquing others</li> </ul>
Prototype/model	What process will we need to make our prototype/model? What materials, equipment, skills, expertise, and time frame will we need to be able to make this? Have we got all that we need? Where can we source it if we do not? If we don't have everything we need – can we modify it?	<ul style="list-style-type: none"> <li>- Refine design based on what we can do and get.</li> </ul>
Does it work?	Test prototype/model out and reflect on the functionality. Does there need to be any changes made? (At this point you may wish to send the design through to keepers so that they can suggest any improvements)	<ul style="list-style-type: none"> <li>- Reflection</li> </ul>
Let's see it in action	Revisit the zoo and present the enrichment to the keeper. Do they think it will work? Will it be safe in the environment? If the zoo keeper is happy to put the enrichment into the enclosure then observe what happens. What worked? What didn't work? Could you see any way for improvement?	<ul style="list-style-type: none"> <li>- Field Trip</li> <li>- Observation</li> </ul>
Presenting	Students present their design, their journey and what they learnt along the way.	<ul style="list-style-type: none"> <li>- Presenting ideas – PowerPoint, poster, speech etc.</li> <li>- Peer Assessment</li> </ul>
Reflection – Evaluation of process	What have we achieved? What would we have done differently? Have we answered our Big Question?	<ul style="list-style-type: none"> <li>- Reflection</li> <li>- Evaluation</li> </ul>

## References and Resources - Websites

**Auckland Zoo** - <http://www.aucklandzoo.co.nz/sites/explore-the-zoo/animal-enrichment/animal-enrichment>

*Information on Auckland Zoo's enrichment programme and examples of enrichment for your pets at home.*

**Environmental Enrichment Scrapbook** -

[www.well.com/user/abs/dbs/eesb/](http://www.well.com/user/abs/dbs/eesb/)

*This website provides examples of species specific enrichment and asks for you to share your ideas.*

**The Shape of Enrichment** – [www.enrichment.org](http://www.enrichment.org)

*This website has general information on enrichment in zoos.*

**Animal Enrichment** - [www.animalenrichment.org](http://www.animalenrichment.org)

*The website provides general information on enrichment, how to create an enrichment programme, S.P.I.D.E.R. model as a process for enrichment projects, examples of species specific enrichment and a large number of enrichment related resources.*

**National Zoo** -

[www.nationalzoo.si.edu/SCBI/AnimalEnrichment/default.cfm](http://www.nationalzoo.si.edu/SCBI/AnimalEnrichment/default.cfm)

*This website provides an overview of what is enrichment and what to consider when designing enrichment.*

**Honolulu Zoo** - <http://www.honolulu zoo.org/support-the-zoo/environmental-enrichment-program.html>

*Information on Honolulu Zoo's enrichment programme, with lots of pictures and videos.*

## References and Resources - Books

**Animals at Play: Rules of the Game** - Marc Bekoff

[Picture book – Ages 8+]

*In "Animals at Play", Bekoff shows us how animals behave when they play, with full-colour illustrations showing animals in action and having fun - from squirrels climbing up a tree to polar bears somersaulting in the snow.*

**Sniff, Swing, Swipe** – Rupert Alchin

[Connected 2, 2006 – Ministry of Education]

*This article is about how the Sniff, Swing, Swipe project began at the Auckland Zoo in 2001. It share some of the ideas sent in by school children.*

**Environmental Education in New Zealand Schools**

[Ministry of Education]

*National Library of NZ and local libraries will have books to help with this topic.*