

# Biological Diversity

## Teacher information pack

### Stage 6 resource



#### OUTCOMES CONTRIBUTED TO:

BIO11/12-1

BIO11/12-2

BIO11/12-7

BIO11-10



# Content Overview



## Module 3 Biological Diversity – Depth Study

### Outcomes

#### A student:

- ✔ develops and evaluates questions and hypotheses for scientific investigation BIO11/12-1
- ✔ designs and evaluates investigations in order to obtain primary and secondary data and information BIO11/12-2
- ✔ communicates scientific understanding using suitable language and terminology for a specific audience or purpose BIO11/12-7
- ✔ describes biological diversity by explaining the relationships between a range of organisms in terms of specialisation for selected habitats and evolution of species BIO11-10

### Content

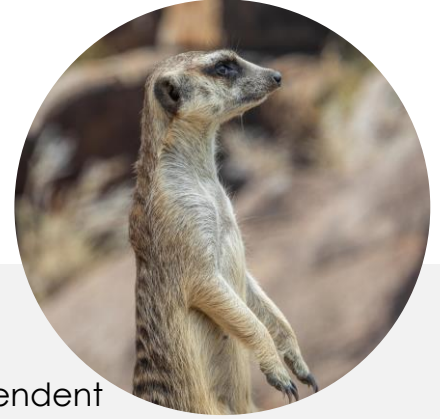
#### Adaptations

**Inquiry question:** How do adaptations increase the organism's ability to survive?

Students:

- ✔ conduct practical investigations, individually or in teams, or use secondary sources to examine the adaptations of organisms that increase their ability to survive in their environment, including:
  - structural adaptations
  - physiological adaptations
  - behavioural adaptations

# Biological Diversity at Sydney Zoo



Students will get the chance to research a species, their habitat and adaptations that help them to survive in the wild. Species offered as part of this program are dependent on availability. They include:

## **Meerkats**

## **Offers**

**Aquarium species – little penguins, turtles, water dragons and archer fish**

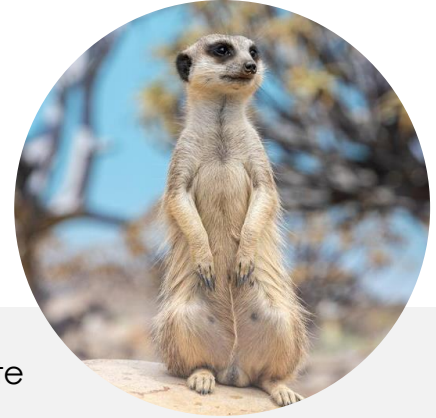
**Dates will be updated on the website with species specifically mentioned.**

**Guidelines will be provided that are species specific for safe materials and designs.**

Students will then design and create an enrichment item to engage the chosen species and use their unique adaptations. They will need to work in teams or as a class – the maximum number of enrichment items will be listed when booking. The items are brought into Sydney Zoo on their designated excursion day. Students can assess how well their creation is received and if it engaged the species in using the intended adaptations. See an example below from our pilot Meerkat program in 2022.



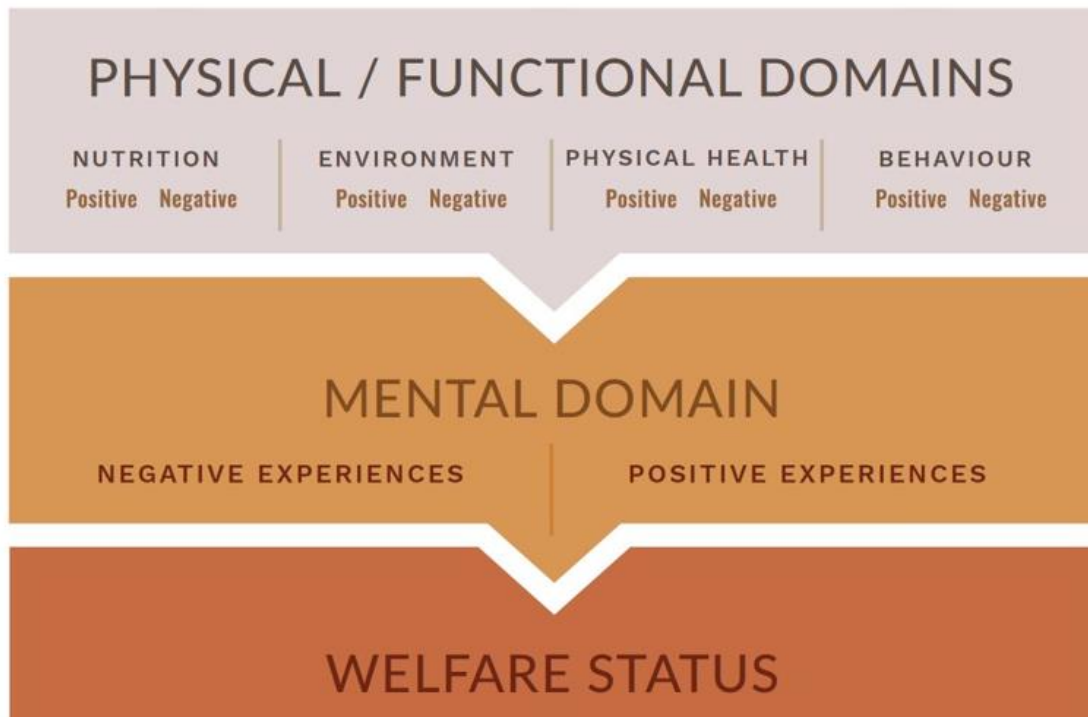
# Animal care in a zoo



Zookeepers are tasked with creating a positive welfare state for the animals in their care. What does this mean?

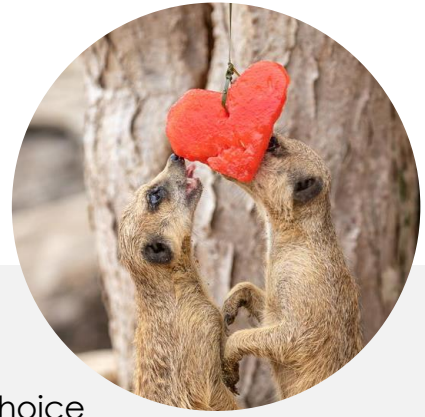
An animal's nutritional needs must be met as well as their physical health needs, environmental needs and behavioural needs. If we do well in providing for the animals in our care then we are also looking after their mental needs and creating a positive welfare state for our animals. The model currently used in our zoo is the 5 domains of animal welfare.

Some people may have heard of the 5 freedoms (freedom from thirst, hunger, discomfort, pain/injury/disease and freedom to express natural behaviours). The 5 domains of animal welfare go beyond these freedoms.



5 domains of animal welfare. *Image from zooaquarium.org.au*

# Enrichment



Enrichment is a very important part of creating a positive welfare state for our animals. Different kinds of enrichment will allow the animals to exhibit natural behaviours, have choice in their daily routines and provide for physical and mental stimulation.

Enrichment comes in many forms and there are lots of considerations including, is it:

- ✔ safe for the animals (this requires planning and research for your design)
- ✔ appropriate for the animal (this requires background research)
- ✔ easily used by keepers
- ✔ easy to add food to if that is the intention
- ✔ easy to clean
- ✔ will actually stimulate your animal – see the different types of enrichment below

## Examples of types of enrichment

Sensory/ Olfactory	Environmental	Cognitive/ Manipulative/ Toys	Food based	Behavioural/ social
Using sounds, smells, textures for the animals to investigate with their different senses (sight, hearing, smell, touch, taste)	Recreating their habitat in new ways for them to explore, adding new items e.g. rocks and logs, live plants, bubble baths, digging new holes	Chew toys, boxes, training sessions, whole foods they need to take apart or other items they need to manipulate and interact with mouths or claws	Food items that are new, or fed in different ways e.g. freeze into ice blocks, food scattered instead of in bowls	Play recordings of animal calls, using animal scents from other parts of the zoo, allowing interaction (even if only visual) with other animals

# Enrichment project

**Students design a scientific investigation to test one adaptation of a selected species that increase their ability to survive in their environment.**

To complete your task you will need to:

- ✔ research their environment in the wild to understand where they have evolved to live
- ✔ research the structural, physiological and behavioural adaptations they have to aid their survival
- ✔ research different types of enrichment
- ✔ in a small team or class, design and build a suitable enrichment item following the below
- ✔ bring your item to Sydney Zoo on your set excursion date for keepers to install in the exhibit
- ✔ gather data to investigate how well your enrichment item was used/received by them and how well it encouraged their use of your chosen adaptation
- ✔ complete scientific report.





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