Objectives

• To investigate how animals’ learned and innate behaviours are managed in the Zoo.
• To explore the Zoo to compare social arrangements and survival strategies.
• To develop your understanding of the link between investigation and animal behaviour theories.
• To present your findings for peer review and debate, using scientific language and knowledge.

These objectives support the learning of students towards achieving achievement standard 3.4: Describe animal and plant responses in relation to environmental factors.

This worksheet will give you more information on the following topics:

• Innate versus learned behaviour (the role of training and enrichment in a Zoo)
• Solitary versus group living
• Inter and intra-specific interactions
• Reproduction strategies

Read the information and answer the questions as you explore the Zoo. The final page of this worksheet asks you to complete extended animal observations.

Innate versus learned behaviour

As you explore the Zoo you will see various examples of animal behaviour.

What sort of behaviour would you like to investigate?

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Innate versus learned behaviour (cont.)

The behaviour you see may be innate, i.e. unlearned, such as a lizard poking out its tongue to taste or ‘smell’ the air around it.

What are some other examples of innate behaviours that you might observe in the Zoo?

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Another type of behaviour you may observe is learned behaviours, such as chimpanzees pair-grooming.

What is the reason for this type of behaviour? How is it learnt? What other examples of learned behaviours might you observe in the Zoo?

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In a captive environment, the behaviour of animals can be modified in a number of ways, primarily through training and enrichment.

Case study: Sun bear training

Purpose

• For medical procedures. This picture is of a keeper conditioning a sun bear to cooperate during medical procedures, (e.g. dental hygiene, taking temperature, and drawing blood)

• For husbandry purposes, e.g. moving a dangerous animal from one part of the enclosure to another for safe cleaning of the enclosure

• For visitor interaction, e.g. training a cockatoo to fly around the Wild Theatre.
Have you ever trained an animal (or a person!)? What was the process and outcome of the training? If you haven’t, how would you train a pet to perform a desired behaviour, such as getting a dog to sit on command?

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How does it work?

• Keepers need to have a good understanding of the animals’ natural history, individual history, and individual behaviour. For example, Sean our male sun bear is a rescue bear, who was relocated to Wellington Zoo from Perth Zoo. He was sent to Australia by Free the Bears after he was found outside a store in Cambodia in 1996. (find out more about Free the Bears here: www.freethebears.org.au).

• Keepers use conditioning, which is a process of behaviour modification, to train the sun bears to perform a desired behaviour, for example to open their mouths on signal. Cues, criteria, bridging stimuli, reinforcements (both food and non-food), and reinforcement schedules are used to help train behaviours. It is important to know what the animals’ primary sensory modalities are (e.g. sight, sound, smell) in order to select the best training tools. For example, sun bears have relatively poor eyesight; therefore a visual cue won’t be as effective as an auditory cue.

• Food as reward! Rewarding the animal when it achieves the desired behaviour is a key step in the training process. It is important that the keeper knows what food the animal loves the most, which could then be used for positive reinforcement. E.g. for the sun bears, keepers use grapes and pears, and a special honey and water mix.

• Keepers also need to know what medical conditions are common to the particular species, so that they can develop training that will facilitate the monitoring of that condition. For example, the carnivore keepers have trained the sun bears to present their paws for spraying gel on their cracked skin, a condition common to sun bears.

When does training take place?

• Training occurs on a regular basis, various times during a weekly period, in order to maintain behaviours. The timing of the training will depend on when the species is most active in the wild; this is when they will be most receptive to the keeper training them.
Attend our animal talks so that you can see animal training in action! What evidence of animal training can you gather from around the Zoo?

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Case study: Enrichment with the otters

**Purpose**

- To promote specific natural behaviours, e.g. foraging or exploring
- To provide a stimulating environment
- To increase physical fitness.

**How does it work?**

The key idea with animal enrichment is that the most effective enrichment is usually novel and random! Enrichment can be something simple like changing the lay out of the animal’s enclosure, for example; it could involve textures, such as different substrates (flooring); smells; sounds; toys; and feeders or food presentation.

The above picture is of one of our otters using its sensitive front paws to dig food out of a special feeder.

**What are the benefits of this type of enrichment? What other enrichment do you think would be great to use with an otter?**

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Solitary versus group living

The social organisation of animals and their behavioural adaptations affect their ability to survive and reproduce, and so are the products of natural selection. Few animals lead totally solitary lives and may live in cooperative groups for all or part of their lives.

Case study: Solitary living with the Sumatran tiger

Sumatran tigers are an example of a solitary animal. They spend most of their lives without others of their species, only coming together to mate or raise their young.

What are the advantages of solitary living? What are the disadvantages?

Advantages:_____________________________________________________________________
________________________________________________________________________________

Disadvantages:___________________________________________________________________
________________________________________________________________________________

The two Sumatran tigers we currently house in the Zoo are a mother, Cantik, and her son, Rokan. In the wild, when offspring become independent, the youngster will either leave on its own or be rejected by its parent.

How do you think the Zoo manages this particular innate behaviour in a captive environment?
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Case study: Group living with the capuchin and spider monkeys

There are many examples of group living at Wellington Zoo. These are animals of the same species that have formed a permanent group of adults that live together.

Which animals can you identify as ‘social animals’?
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________________________________________________________________________________

What are the advantages of group living? What are the disadvantages?
Advantages: _______________________________________________________________________
________________________________________________________________________________
Disadvantages: ____________________________________________________________________
________________________________________________________________________________

Capuchin and spider monkeys are two examples of social animals. They live in a large troop, which is made up of individuals, living together in an organised way, where resources and activities are divided and they rely on each other for survival.

It is important for keepers to understand the typical group size, structure, and any dominance relationships, so that they can help manage group dynamics.

Intra and inter specific interactions

There are two different types of animal interactions: intraspecific, and interspecific. Identify the type of interaction from the following examples:

• A pack of dingoes hunting a kangaroo. ____________________________________________

• One meerkat calls to other meerkats within its mob, alerting them to potential danger. ______________________________________

When studying or observing animal interactions in the Zoo, there are a number of behaviours you should look out for, including: competition, display, pair bonding, aggression, and submission.
Case study: Intraspecific interactions with the chimpanzees

Wellington Zoo’s various primate species are excellent subjects for the study of intraspecific interactions.

We have 12 chimpanzees, the oldest Sam, who was born in 1977, and the youngest, Malika, was born in 2010.

What sort of behaviours do you expect to observe in a chimpanzee troop?
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__________________________________________________________________________
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Chimpanzees live in troops with a clear hierarchy, where there is competition for the alpha male position. In the wild, young females transfer to other groups to breed.

How do you think the dominant male maintains his position? What are the advantages of being a dominant male?
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Parental care is important for chimpanzees. Chimpanzees are more evolved ‘culturally’ than other mammal species; therefore there are a lot more learned behaviours.

Observe the chimpanzees in our troop and see if you can identify specific behaviours that indicate their cultural evolution. Note them down here:
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Reproduction strategies

Animals are classified within a particular reproduction strategy, according to the degree to which males and females bond during courtship, the number of young born, and the extent of parental care.

Case study: Reproduction strategies with the ostriches, tuatara, and lions

95% of birds are monogamous, breeding with only one partner for one breeding season, several seasons, or until death of one partner. In birds most ‘courting’ is done by the males.

What are some examples of bird courtship, such as song?

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Why is courtship necessary?

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Among most groups of animals, male parental care is rare. In birds, however, it is quite common. Territory and nest site defense, incubation, and chick feeding can be shared tasks. Ostriches have communal nests, made by the male, with one dominant female and male incubating for the other females, usually 25 eggs are laid, but nearly half don’t hatch. The parents keep close watch over the chicks constantly, leading them to food, water and providing shade for them.

Compare this strategy with a reptile, like the tuatara, where sexual development is slow and little parental care is given.

Tuatara reach sexual maturity around ten to 13 years of age, with the female producing a clutch of between six to ten eggs, on average, once every four years. Mating occurs in late summer and eggs are laid underground in special nesting burrows some months later. The eggs hatch after 12-14 months incubation and the young fend for themselves.
Now consider the reproduction strategy of lions. The size of a lion's litter depends on the age and dietary condition of the mother. However, it is usually one to four cubs. The lion pride synchronises reproduction so that they can raise their cubs together, with females suckling other cubs as well as their own.

If a pride is taken over by a new male, he will most likely kill any existing cubs, less than two years of age. He will then breed with the females, ensuring that the genes of the fittest male are passed on.

**What influence do environmental conditions have on an animals' reproduction strategy?**

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________________________________________________________________________________
Select two groups of animals to observe, and observe each group of animals for 10 minutes. Note down any of the behaviours listed as they occur during your observation.

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Group 1:</th>
<th>Group 2:</th>
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<tbody>
<tr>
<td><strong>Grooming:</strong></td>
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<tr>
<td>Self grooming</td>
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<td>Same sex grooming</td>
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<td>Male/female grooming</td>
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<tr>
<td><strong>Communication:</strong></td>
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<tr>
<td>Aggressive facial display</td>
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<td>Aggressive action</td>
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<td>Aggressive noise</td>
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<td>Submissive action</td>
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<td>Communicating with a human</td>
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<tr>
<td><strong>Parental Care:</strong></td>
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<td>Mother feeding young</td>
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<td>Mother carrying young around</td>
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<td>Mother grooming young</td>
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<td>Other females interacting with young</td>
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<tr>
<td>Males interacting with young</td>
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<td><strong>Locomotion:</strong></td>
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<td>Climbing</td>
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<td>Brachiation</td>
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<tr>
<td>Quadrupedalism</td>
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<td>Knuckle walking</td>
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<tr>
<td>Bipedalism</td>
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<tr>
<td>Remaining still</td>
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<td><strong>Tool use:</strong></td>
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<td>Use of sticks</td>
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<td>Use of stones as weapons</td>
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<td>Young playing together</td>
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<td>Adult/ young playing</td>
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<td>Adults playing together</td>
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<tr>
<td><strong>Feeding / Foraging:</strong></td>
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<td><strong>Sleeping / Relaxing:</strong></td>
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<tr>
<td><strong>Mating Behaviour:</strong></td>
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