



Enrichment and Enclosure Design trail Answers

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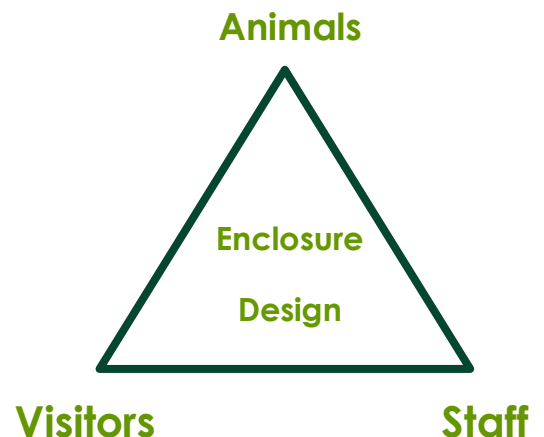
Enrichment aims to stimulate animals both mentally and physically, whilst preserving natural behaviours and preventing the development of abnormal behaviours in captivity.

Enclosure design is an important part of enrichment since enclosures, including their furniture, need to be designed in a way that enriches and stimulates the animals they are designed for whilst promoting natural behaviours.

The design of any enclosure needs to take into account the **five freedoms** of animal welfare:

- 1. Freedom from hunger and thirst**
- 2. Freedom from discomfort**
- 3. Freedom from pain, injury and disease**
- 4. Freedom to behave normally**
- 5. Freedom from fear and distress.**

When designing an enclosure you need to consider the needs of, not only the animals, but also of keeping staff and visitors to the zoo.



At Marwell Zoo we provide our animals with a variety of enrichment opportunities. Apart from the way in which an enclosure is designed, enrichment can include how the animals are fed, the provision of apparatus, sensory stimulation and social husbandry.

As you go around the zoo, look at how different enclosures are designed and what other forms of enrichment our animals are provided with.



1. PENGUIN COVE



Humboldt penguins are named after the Humboldt Current which runs past the coasts of Chile and Peru where these birds live.

a) What natural behaviours might you expect to see a penguin to exhibit?

Swimming, waddling, hopping, grooming, hunting, diving etc are all examples of natural behaviour.

b) How has the penguin enclosure been designed to enable penguins to exhibit these behaviours?

A pool is provided for the penguins to swim, forage, dive etc while rocks are provided for hopping and waddling.

c) How has this exhibit been designed to enable good viewing opportunities for visitors?

Large underwater viewing window and relatively low wall provides visitors with a good view of the penguins both in and out of the water.

2. GIRAFFE

In the wild, giraffe eat a variety of plants but most often eat from acacia trees, which are very thorny. To protect their tongues from these thorns, as well as to help with digestion, giraffe produce a lot of saliva.



a) What food can you see for the giraffe in the giraffe house?

Lucerne (looks like hay) is always available for the giraffe, possibly, some pellets may be visible. They may also have some browse (leafy branches) available.

We cannot provide giraffe with enough trees to eat from at Marwell since they would quickly strip any trees bare. However, giraffe still produce a lot of saliva that they need to use/get rid of somehow. To help with this, sometimes the keepers hang browse (leafy branches) up for the giraffe to feed from.



b) Can you see any browse in the enclosure today? Why do you think the keepers hang browse up high?

Hanging browse high up stimulates the giraffe's natural feeding behaviour and to provides them with a way to use up some of any excess saliva. Hanging the browse up high means the giraffe need to use their long necks and tilt their heads up to reach the browse, as they would in the wild. They will then use their long tongues to wrap around the leaves and pull them off using the same natural feeding behaviour as they would in the wild.

c) Giraffe are some of the largest land mammals and as such need a lot of space, at Marwell our giraffe herd have access to an indoor area, an outdoor hardstand and a large paddock. How have we tried to ensure that guests can usually view the animals wherever they are?

By providing viewing areas at each of the giraffe areas guests are usually able to get excellent views of the giraffe. Tall boardwalks extend into the giraffe paddock overlooking the hardstand area and the paddock itself meaning guests have a good vantage point to see the giraffe, even if they are far away.

Browse isn't always available, especially in the winter. Therefore keepers may hang up food-filled plastic bottles with holes in the side, like the one in the picture.

c) This might be a very unnatural object for the giraffe but it can still promote natural behaviour. How?

Giraffe still have to stretch their long necks up and angle their heads to reach the bottle. They then have to use their long tongues to grasp around and pull the food out of the bottle. Therefore the giraffe's natural feeding behaviour is promoted through an unnatural device.



In order to provide the giraffe with enrichment and daily food the keepers need to be able to safely access their enclosure.

d) What feature of the giraffe house allows the keepers safe access?

Elevated walkways provide ways to top up feeding rack or to hang enrichment devices. Separate areas and the ability to shut off and isolate areas to ensure keepers and giraffe can be kept apart. This avoids the risks associated with being close to such a large animal.

3. LEMUR LOOP



Our walkthrough, 'Lemur Loop' opened in July 2017 and is home to three different species of lemur, allowing guests to get up close to these primates. All lemurs have evolved from a common ancestor and adapted to the variety of habitats found on Madagascar. Over time they have evolved into over 100 different lemur species we find on Madagascar today!

a) Look at the ID signs and list the three species of lemur housed in this enclosure.

1. Crowned lemur
2. Black-and-white ruffed lemur
3. Ring-tailed lemur

b) Although it is fun to get close to the animals, it is important to make sure they do not get stressed by the experience. Name some ways the enclosure offers the lemurs the ability to choose whether or not to interact with guests.

Examples include: guests are restricted to the path; Marwell staff supervise guests at all times. Lemurs can climb trees or retreat to the back of the outdoor enclosure, Lemurs have places to hide and can freely go into their indoor space when they choose.

c) The lemur species housed in the Lemur Loop have different needs. Look around the enclosure or ask some of our friendly staff to help you answer the following question. Name the ways the enclosure attempts to provide the different species with opportunities to exhibit natural behaviours



Answers can include:

- Trees and poles available for the more arboreal species like the crowned lemur and black-and-white ruffed lemur
- Rocks and bare earth available for the ring-tailed (the most terrestrial of the lemurs) provide opportunities to forage
- Bamboo and reeds are planted around a small pond which replicates the natural reed bed environment of the gentle lemur
- Edible trees provide feeding opportunities and associated natural behaviours for all species
- Tall poles and ropes provide areas for all lemurs to scent mark and observe their territory; while the black-and-white ruffed lemur often call from higher vantage points to enable the vocalisation will carry further

4. LEOPARD LOOKOUT



The Amur leopard is one of the most threatened species of cat, with as few as 70 individuals left in the wild. Any enclosure attempts to meet the needs of the animals, visitors and staff. Our Amur leopard enclosure was designed to showcase this beautiful threatened species in a way that also meets those needs.

a) In the box below draw a sketch of the Amur leopard enclosure.

b) Annotate the features that provide enrichment for our Amur leopards and explain what natural behaviours this enrichment promotes (e.g. den rest in).

c) Annotate the features of the Amur leopard enclosure that enhance visitor experience as well as those features that help to keep guests safe (e.g. wire mesh roof so leopards can't climb out).

b) Enrichment for Amur leopards:

Platforms – to climb on and provide leopards with a place that they can view their territory from

Logs and rocks – for leopards to scent mark – to mark their territory

Hidden areas – so that the leopards can choose to move out of sight if they want to

c) Features for visitors:

Glass windows – enable visitors to get close to leopards safely

Raised windows on walkway – provide visitors with an elevated view of the leopards and their enclosure

Safety barrier around the parts of the enclosure that are meshed – to reduce the risk of visitors getting too close to the leopards/putting their fingers in the enclosure





5. WILD EXPLORERS

The wild Explorer's area is a mixed species exhibit housing four large African animals; our southern white rhino, scimitar horned oryx, Grevy's zebra and ostrich.

a) This enclosure doesn't contain lots of apparatus such as poles and ropes like some of our other enclosures, why do you think this is?



None of the animals are adapted for climbing so ropes and poles are not an appropriate type of enrichment.

b) The Wild Explorers enclosure largely consists of a large open paddock. Why is this suitable enrichment for these animals?

As the animals housed in this exhibit are grazers. The open paddock provides a large area for the animals to graze and move around in.

At Marwell we are involved in reintroducing certain species. For example, we are currently part of a programme for the reintroduction of the (extinct in the wild) scimitar-horned oryx into its former range in Chad, as well as previous successful reintroductions into protected reserves in Tunisia.

c) Why do you think allowing species to mix is important enrichment?

By keeping animals in mixed exhibits they can be provided with an environment similar to their natural habitat. Mixing with different species provides enrichment for the animals and helps to develop social dynamics with other non-conflict species. This is particularly important for any animals that might be suitable for reintroduction programmes, as they will be familiar with situations when they may need to share space and resources with other species. As this is what they would experience in the wild. We want the animals to be able to display appropriate natural behaviours around other non-conflict species.

c) Some additional enrichment is provided in the form of mud wallows and sand mounds in the paddock. What natural behaviour does this promote?

The Grevy's Zebra and ostriches will often dust bathe, while white rhinos mud roll, these areas provide opportunities to do this.



d) Why do you think it is important to promote this natural behaviour?

The mud and dust cleanses the skin, removing ectoparasites (parasites that live on the outside of their host) and helping to prevent sunburn (in rhinos).





6. MEERKATS

The keepers often scatter the meerkats' insect feed around their enclosure and sometimes place bugs into the crevices of logs and rocks.



a) Why do you think the keepers feed the meerkats in this way?

In the wild, meerkats spend a lot of their time foraging on the ground and digging for food (insects and small rodents.) By scattering their food so that some of it ends up buried, promotes this natural behaviour, encouraging the meerkats to use their senses and forage as they would in the wild.

B) Meerkats are found in most regions of southern Africa, and are adapted to life in arid conditions. What can you see in the enclosure that helps the meerkats in the temperate conditions found in Hampshire?

There are heat lamps available for the meerkats to help keep them warm when the weather is cold. There are also sheltered and indoor areas for the meerkats to retreat to if they need to keep warm and/or dry.

7. AMUR TIGER

Amur tigers are mostly found in south-eastern Russia and northern China. The Amur River runs through the range of these tigers.

a) Why do you think pools are provided in the tiger enclosure? Try to give 2 reasons.

Amur tigers would naturally come across water in the wild in the form of the Amur River
- To provide the tigers with an exercise opportunity since tigers often swim
- To provide the tigers with somewhere to cool off in the summer
- Bathing in the water helps to keep their skin Clean



b) Platforms are provided for the tigers within their enclosure. Why do you think they are important for the tigers?

- Provides a lookout post for them to observe their territory
- Provides an area to sleep/rest/bask on
- Stimulates climbing behaviour
- Provides a secure higher position when they are feel vulnerable (e.g. when eating)



A large part of keeping zoo animals healthy is providing the correct diet and nutrition. At Marwell, our cats, including the tigers, have a fast (starve) day twice a week.

b) Why do you think our tigers are not fed every day?

In the wild they would not get the chance to find prey every day and one large meal could last them several days. By providing fast days we can more closely replicate the natural eating habits of the large cats. It also helps to maintain a healthy weight.

8. SIAMANG

The siamang is an arboreal (tree dwelling) primate native to the forests of Malaysia, Thailand, and Sumatra.



a) Many of the ropes in this enclosure move and swing around. Why do you think they have been designed to do this?

The ropes simulate natural branches, which are not fixed in one position but often swing about. This enables the siamang to improve their co-ordination and muscle tone whilst moving around. As they are adapted for life in the trees, it is important for the siamang to be provided with appropriate apparatus to allow them to move in the same way they would in the wild.

b) Like many of the animals at Marwell zoo the siamang are sometimes given novel (new/not seen before) food items as well as devices like feeding balls. What natural behaviour does this stimulate?

Novel food items provide mental stimulation as the animals have to problem-solve as they work out how to get to the food. Feeding balls and other enrichment devices also do this as well as promoting activity and encouraging foraging behaviours.





9. ASIAN SMALL-CLAWED OTTER

Our Asian small-clawed otters, like the other animals at Marwell, are provided with dens to rest and shelter in.



a) Which two of the five freedoms listed in the introduction do you think this feature is most relevant to?

- Freedom from discomfort; the den provides somewhere comfortable for the animals to rest
- Freedom from fear and distress; the den provides somewhere to go out of sight if the animal chooses to be away from guests

b) The Asian small clawed otters have access to fresh flowing water why is this a necessary part of their enclosure?

The small clawed otter is a semi-aquatic mammal and has many adaptations to this lifestyle. In a zoo otters require access to water in order to display many of their natural behaviours.

10. SNOW LEOPARD

Wild snow leopards are found in the Himalayan Mountains.

a) What would you expect the conditions to be like in the snow leopards natural habitat?

The conditions are cold and it is often snowy. The surrounding landscape is rocky, with many steep slopes and narrow ledges.



b) How is this habitat simulated in the snow leopard enclosure?

The enclosure has lots of rocks, caves, narrow ledges and raised rocks to simulate the landscape of the mountains.

c) What natural behaviours does this promote?

Climbing and balancing



Sometimes the snow leopards, as well as some of our other cats, are given a sack feed, whereby their food is wrapped in a hessian sack and hung up in their enclosure.



Although this is not the same as hunting their own prey (it would be unethical to put live prey in with the snow leopards), it does stimulate many of the same natural behaviours.

d) What natural behaviours do you think are stimulated through providing the snow leopards with food in this way?

Snow leopards need to use their muscles to pull the sack down, just like they would their prey in the wild. They then need to rip the sack open, which is like ripping through the skin of their prey. The hessian sack also acts like a dental floss keeping their teeth healthy in the same way the fur of their prey would.

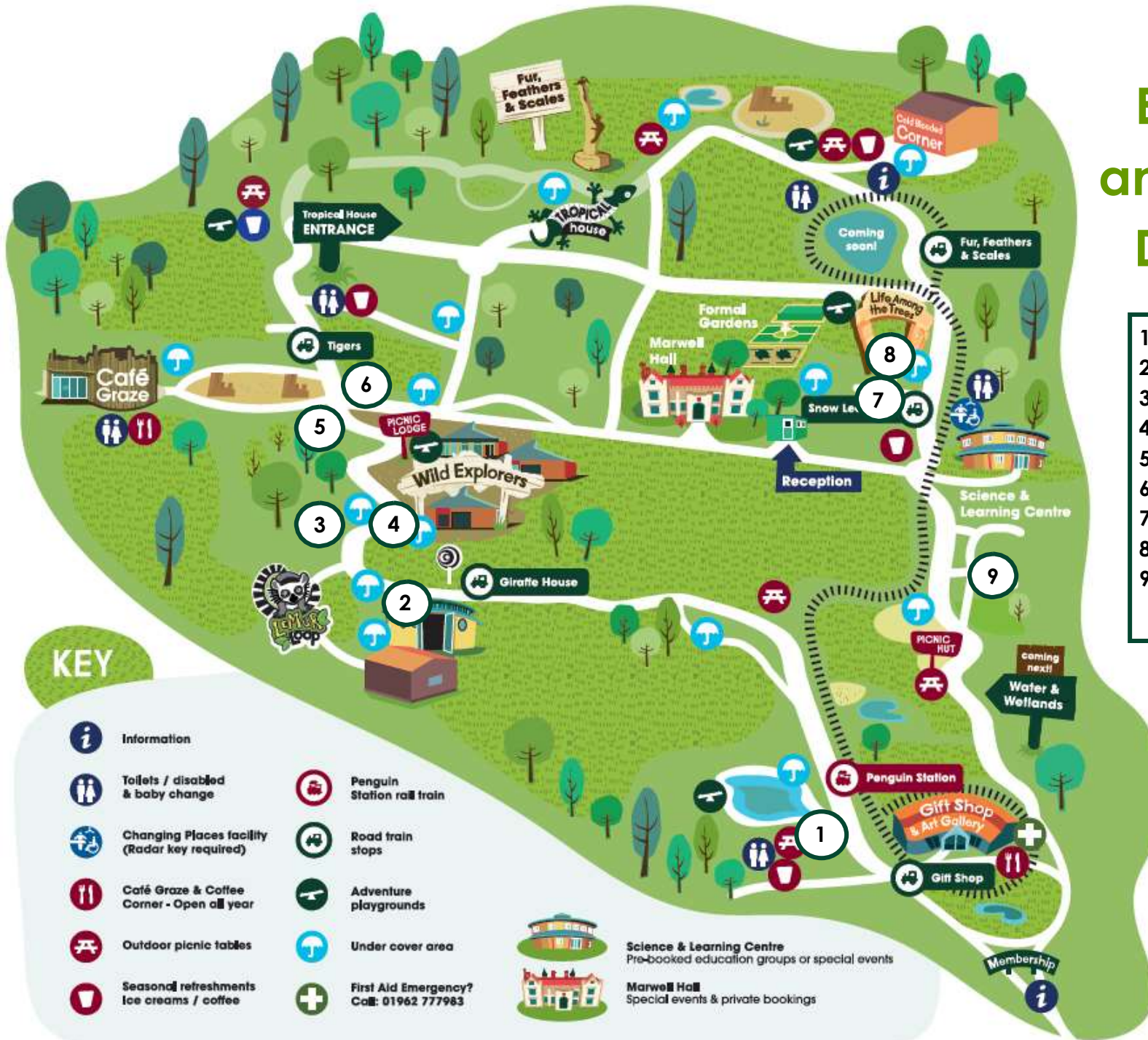
e) Sometimes scents including herbs and spices are placed around the enclosure of snow leopards and some other animals. Why do you think this type of enrichment is important for a territorial carnivore?

New scents stimulate the olfactory senses (sense of smell). These senses are extremely important to territorial carnivores as they spend a lot of time smelling and marking their territory. Using scent enrichment can encourage general activity and promote natural behaviours like scent marking.

Well done! You have completed the enrichment and enclosure design trail. At Marwell zoo we provide our animals with a variety of enrichment so try to spot any enrichment items there may be in the enclosures. Also, look out for other ways our enclosures are designed for the specific needs of the other animals you see around the zoo.



Enrichment and Enclosure Design Trail



1. Humboldt penguins
2. Giraffe
3. Amur leopard
4. Wild explorers
5. Meerkat
6. Amur tiger
7. Siamang gibbons
8. Asian small-clawed otters
9. Snow leopard