

# Zoo Activity Pack: Animal Behaviour

This pack is designed to provide teachers with information to help you lead a trip to Colchester Zoo focusing on psychology and biology.



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# How to Use this Pack

This Animal Behaviour Pack was designed to help your students learn about the behaviour of animals, and prepare them for a trip to Colchester Zoo.

There is also a map of the zoo that highlights animals mentioned in this pack and can be used for other key information. We recommend all teachers read through this, and give copies to adult helpers attending your school trip. For information on feed times and encounters, please check the website.

The rest of the pack is broken into: pre-trip, at the zoo, and post-trip. Each of these sections starts with some general ideas. Worksheets are typically paper hand-outs that teachers can photocopy and have pupils complete independently. Teachers can pick and choose which they want to use since all the activities/worksheets can be used independently (you can just use one worksheet if you wish; you don't need to complete the others).

The activities and worksheets included in this pack are for KS4 and 5 students.

We suggest using the pre-trip ideas prior to your trip to familiarise your pupils with vocabulary, context, and the animals they will see during your trip. The at the zoo activities/worksheets typically require information your pupils can gather while they are at Colchester Zoo and are designed for completion during your school trip. The post-trip ideas are designed to be used after your visit to help consolidate learning and build on information gathered during your school trip. Within these sections, the activities/worksheets can be used in any order.

If you would like any more guidance, or have any questions about any of the information contained within this pack, please contact our education department at [education@colchesterzoo.org](mailto:education@colchesterzoo.org)

# Map KEYS

-  First Aid
-  Information
-  Gift Shop
-  Picnic Area
-  Play Area
-  Toilets
-  Fire Assembly Point
-  Face Painting



- 1—Chimpanzees
- 2—Capuchins monkeys
- 3—Orangutan
- 4—Flamingos
- 5—Mixed African Enclosure

Download a more detailed map from our website:  
[www.colchester-zoo.com](http://www.colchester-zoo.com)

# Vocabulary Words

<b>Adaptation:</b>	The process of change by which an organism or species becomes better suited to its environment.
<b>Carnivore:</b>	An animal that eats meat
<b>Dominant:</b>	A individual that out ranks other individuals
<b>Ethogram:</b>	A list of behaviours that animals perform
<b>Ethology :</b>	The science and study of animal behaviour
<b>Habitat:</b>	The type of place an animal lives (e.g. savannah, rainforest, etc.)
<b>Herbivore:</b>	An animal that eats vegetation
<b>Hierarchy:</b>	A system in which individuals are arranged according to rank
<b>Negative:</b>	Taking something away, not necessarily punishment
<b>Omnivore:</b>	An animal that eats plants and meat
<b>Positive:</b>	Adding something, not necessarily a reward
<b>Punishment:</b>	Used to decrease a behaviour
<b>Reinforcement :</b>	Used to increase a behaviour
<b>Tool:</b>	An object that is modified or created to help complete a task

# Background Information

## What is behaviour?

Behaviour is a response to a stimulus, which can be expressed consciously and/or sub-consciously.

## What is innate behaviour?

Innate behaviour is done automatically, which requires no experience or thought process to complete. An example of this would be a reflex action for when a human touches something hot with their hands they pull away almost instantly.

Examples in other animals include, bird chicks hatching out of eggs or sea turtles hatching and following lights over the water to guide them to the sea. Sea turtles' innate behaviour is so automated that if there is a large amount of artificial light (street lights etc) the newly hatched sea turtles will head towards those lights if they are brighter than the moon or star light, this results in the sea turtles heading in land rather than the sea.

## What is learned behaviour?

There are many forms of learned behaviour. These include:

- Trial and error: making mistakes and learning from them.
- Habituation: becoming use to a stimulus till there is no longer a reaction.
- Conditioning: being trained to perform or not perform a certain action.
- Insight and reasoning: problem solving.
- Social learning: imitating an others behaviour. Also includes tutoring.

## Imprinting

Imprinting is an innate learned behaviour and is classed as phased sensitive learning, which is when learning occurs at a particular age or a life stage.

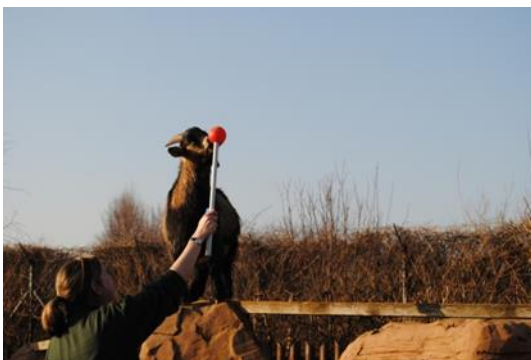
This is critical period of time early in an animal's life allowing the animal to develop attachments. The individual the young imprint on is considered the mother and who then tutors the young in survival techniques.

# Conditioning Animal Training

At Colchester Zoo most of the animals are trained to do certain behaviours. The main training that takes place is target training.

Target training involves the animal to touch a target, either with their nose or hand and can lead to very specific part of the animal such as its tail.

The target can be a ball on a stick or a disk on a stick. A target can even be a hand. Below are pictures of different animals being target trained.



Once the basic target training has been done, it is then easier to train more complex behaviours.

Such as animals trained to present their tails to have injections.

# Conditioning

## Animal Training

Animals can learn to recognise objects and perform novel behaviours.  
There are two types of conditioning:

- Classical
- Operant

Classical is stimulus and consequence.  
Operant is behaviour and consequence.

A good example of classical conditioning is Pavlov's dogs.

There are 4 types of operant conditioning that can be used to train animals. Below is a table showing this.

### Different Types of Operant Conditioning

	<b>Reinforcement</b> (behaviour increases)	<b>Punishment</b> (behaviour decreases)
<b>Positive</b> (adding something)	<b>Reward</b>	<b>Punishment</b>
<b>Negative</b> (removing something)	<b>Escape</b>	<b>Penalty</b>





You need to remember that negative means more than just taking something away rather than a punishment, and positive means adding something (addition) rather than necessarily a reward.



# Conditioning

## Animal Training

The table below is an example of how the 4 type of operant conditioning can be used to get a student to do their homework.

	<b>Reinforcement</b> (behaviour increases)	<b>Punishment</b> (behaviour decreases)
<b>Positive</b> (adding something)	 <p><b>doing homework</b></p>	 <p><b>NOT doing homework</b></p>
<b>Negative</b> (removing something)	 <p><b>doing homework</b></p>	 <p><b>NOT doing homework</b></p>

- **PR** – You did your homework, here, have a cookie. (Result: you will do homework in future in hope of getting a cookie).
- **NR** – I will yell at you until you do homework (Result: you stop not doing your homework to stop me yelling)
- **PP** – You didn't do your homework so I will yell at you. (Result: you don't want to get yelled at, so in future you will do your homework to prevent me yelling)
- **NP** —The TV is removed until you do your homework. (Result: you do your homework to get the TV back)

Negative reinforcement and negative punishment are often hard to tell apart.

Positive punishment is sometimes used if you NEVER want a behaviour to happen again (don't care what else the person/animals does as long as it stops this)

Negative reinforcement works best when you want a specific behaviour to happen.

# Chimpanzee (*Pan troglodytes*)

There are 8 chimpanzees at Colchester Zoo; 3 males and 4 females.

Pippin is the adult male who was born in March 1986. Tara was born in October 1985, and Kora was born in November 1999. Tekita is a female born in February 1996. Tombe is a male who was born here in August 1996. Tumba was born in Dec 2004. Talia was born March 2009.

Chimpanzee's form social groups with a leaner hierarchy. Leaner hierarchy is when more than one individual may be dominant enough to dominate other lower ranking members.

The most dominate male is referred to as the alpha male. This male may not be the strongest or the biggest, instead he will most likely be the most manipulative and influential male. This allows him to form alliances which in turn, give him support and power to obtain and maintain his position.

The alpha male will perform displays by puffing his coat up to make his appearance bigger as well as charging. The aims of these behaviours are to intimidate other members. Lower-ranking chimpanzees will show submissive body language or reaching out their hands while grunting. Female chimpanzees will present their hindquarters. Females have their own hierarchy where dominant females will also form alliances to dominate lower-ranking females.

Males seek dominant status for mating privileges whereas females seek dominant status to secure food as well as other resources.

Young females may inherit high status from a high-ranking mother.

Female acceptance is necessary for an alpha male to maintain his position. The dominant females will sometimes oust an alpha male and support another. This new male would have been supported as the females may see potential in him for leading the group as a better and more successful alpha male.

Chimpanzees are one of the best examples of Machiavellian Intelligence (Social Intelligence Hypothesis) in a non-human animal.

Another example of chimpanzees using aspects of Machiavellian intelligence is seen in the meat sharing hypothesis. Males have been recorded to use meat to entice females but withhold the meat until mating has occurred.

Furthermore if a female begged for meat, she had a better chance of success if she was in season.

# Chimpanzee Facial Expressions



Scream is done when the chimpanzee is nervous or distressed.



A pout is done when the chimpanzees want comforting.



Covered top lip is the chimpanzees play face.



Full smile shows the chimpanzee is fearful.



Pant hoot expression is done when the chimpanzee is excited.



Lips pressed tightly together shows the chimpanzee is expressing anger.

# Tool Use in Chimpanzees

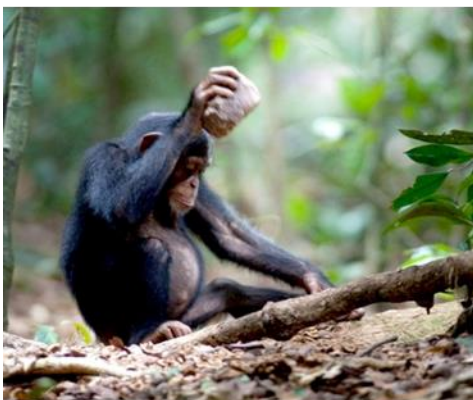
Chimpanzees in the wild have been observed to use objects as tool to help the chimpanzees obtain food that otherwise would be out of reach for them. A chimpanzee will modify sticks by stripping the leaves off and changing the length, and sort through rocks to find the best and easiest one to use.

Stems, twigs, branches, leaves, and rocks have been observed to aid in tasks such as feeding and drinking as well as to help in cleaning themselves and investigating new or out of reach objects. Chimpanzees have also been known to use tool as weapons. Leaves will be chewed to act like sponges to dip into puddles of water to drink and to help get honey.

Rocks and sticks are used to crack open shells and break fruits open. Sticks are often used to retrieve insects, such as ant and termites, from their nests. Males will throw branches, sticks and rocks to enhance charging displays to intimidate the other chimpanzees.

These behaviours will be passed on to the younger chimpanzees through tutoring and observational learning. This is regarded as an example of chimp culture.

Another example of chimp culture can be seen between two different troops using different tools to complete the same task. One troop will only use sticks to retrieve honey from bee hives whereas another troop will only use chewed leaves.



# Mixed Species African Enclosure

At Colchester Zoo the Reticulated giraffe, white rhino, greater kudu, maneless zebra and ostrich share the same outside space.

## **Reticulated giraffe (*Giraffa camelopardalis reticulata*)**

Colchester Zoo has 4 female reticulated giraffes. Lili was born in July 2008 and Isha was born in July 2008. Vera was born in May 2013 and Nzuri was born in March 2014.

## **White rhino (*Ceratotherium simum*)**

There are 5 White rhinos here at Colchester Zoo. Flossy, our eldest female, has been here since 1972, she was then joined in September 2003 by Emily. In November 2009 a male called Otto arrived. After successful breeding a female calf named Pembe was born in April 2013 followed by the birth of Mabaso, a male calf born in July 2014.

## **Greater kudu (*Tragelaphus strepsiceros*)**

Colchester Zoo has one male and one female Kudu. The male is called Cedric and was born in September 2009. The female is called Kumu and she was born in November 2002.

## **Maneless zebra (*Equus quagga borensis*)**

There are 4 female Zebras here at Colchester Zoo. Zanta was born in June 2006, Anna was born in August 1999, Camilla was born in June 2006 and Marge was born in February 2002.

## **Ostrich (*Struthio camelus*)**

At Colchester Zoo there is 1 male and 3 female Ostrich. The male Lewa hatched in July 2010. The females, Kosi hatched in May 2004 with Doris and Budgie, who are sisters, hatched in November 2010.

# Chilean flamingo (*Phoenicopterus chilensis*)

At Colchester Zoo there are 30 Chilean flamingos. In the wild flocks can number in the thousands. Studies suggest the benefits for such large numbers include, improved protection from predators and maximise feeding opportunity.

In captivity it is impossible to house flocks that have thousands of individuals. A way zoos can overcome this problem is by using mirrors. The mirrors create the illusion of more flamingos and in effect double the amount of flamingos.

Despite flamingos forming large flocks they will often break into smaller groups. These groups are made up of close bonded pairs and individuals forming a “friendship”.



## Courtship

Flamingos perform synchronised courtship displays, made up of both males and females. The flamingos stand and move together stretching their necks upwards, then uttering calls while head-flagging. The display is not directed to any one individual. These displays act as a way to synchronise nesting as well as help flamingos pair up who do not have a mate already.



# Behaviours which you may see around the ZOO

## **Sleeping:**

Inactive with eyes shut, can be in a sitting or lying position

## **Foraging:**

Searching or looking for food

## **Allo-grooming:**

Animal uses teeth, lips, nails and/or objects to groom another individual

## **Vocalising:**

Making noises

## **Play:**

Social interactions involving non-aggressive physical contact with an individual or solitary play behaviour

## **Other:**

Animal performs any behaviour not already described e.g. copulation

## **Resting/ inactive:**

Inactive, eyes open, animal in a stationary, resting position. Can be in a sitting, standing or lying position

## **Feeding:**

Eating or drinking from a food or water source

## **Auto-grooming:**

Animal uses teeth, lips, nails and/or objects to groom itself

## **Locomotion:**

Climbing, walking, swinging, sliding or other behaviours to move around in the enclosure

## **Aggression:**

Aggressive interactions towards another individual

## **Out of Sight:**

The animal is hidden from view, whether in a different section of the enclosure or under an object

# Enrichment

In the wild, animals will spend a considerable amount of time and energy finding and processing food, building their nests and defending their territory boundaries. The majority of their waking hours may be spent meeting these needs.

Due to the high quality of care provided within a zoo environment, the time an animal spends in these pursuits is significantly reduced, so this high standard of care may not address the behavioural needs that are associated with these activities.

The aim of environmental enrichment is to increase animal well being by increasing exercise, satisfying behavioural needs and optimising the level of stimulation that our animals receive, as well as attempting to reduce abnormal behaviours. Enrichment also increases the visibility of the animals and keeps them active.

Environmental Enrichment is a term used to describe various activities that keepers utilise to encourage natural behaviours from the animals under their care. The purpose of enrichment is to encourage behaviours that are appropriate for that species and that satisfy an animal's physical and psychological needs.

Enrichment is achieved by adding to a captive animal's environment or by modifying the furnishings within it, the feeding structure and presentation of food or by the social grouping. The provision of environmental enrichment is extremely important to a captive animal's wellbeing and these techniques provide opportunities for our animals to have control over their environments and to occupy their time.

"An enriched zoo environment is defined as one that is interesting, allows animals to perform natural behaviour, permits them to be more active, provides additional choices and increases the animals' control over their environment" (David Shepherdson -1st Environmental Enrichment Conference, Oregon 1993)

The next page show some examples of enrichment given to the animals.



# Enrichment Examples



# Pre-Trip Classroom Ideas

These are ideas to help teachers set tasks based on the information provided in this pack.

In groups, have the student's research one of the following people and create a poster about who they are and include information on the work they conducted. The following people are: Nikolaas Tinbergen, Konrad Lorenz, Karl von Frisch, Louis Leakey, Jane Goodall, Dian Fossey, Birute Galdikas and E.O. Wilson.

Show the students videos of animals performing intelligent tests. Chimpanzees, orangutans, capuchin monkeys and crows have all shown tool use and problem solving behaviours. A YouTube search can be done to find these videos.

Depending on resource, recreate these intelligent tests for the students to do as puzzles and games. Make sure the students haven't seen the videos before or have them test other students or staff.

Create a list of behaviours that both humans and animals show, such as playing. Once a list has been made discuss whether they are instincts or learned behaviours. For all the learned behaviours, explain how it was learnt.

# At the Zoo Activities

## Ethogram

An ethogram is a list of behaviours animals perform. They can be basic or in-depth. Below is an example of a basic ethogram for a tiger:

<b>Behaviour</b>
<b>Walking</b>
<b>Running</b>
<b>Sitting</b>
<b>Social interaction</b>
<b>Sleeping</b>
<b>Eating</b>
<b>Drinking</b>
<b>Self-grooming</b>
<b>Marking territory</b>

# At the Zoo Activities

These are ideas to help teachers set tasks based on the information provided in this pack and the animals at Colchester Zoo.

## Ethogram Task

Use the basic ethogram as a base to create a more detailed ethogram for the tigers. It is recommended that you observe the tigers to help. For example for social interactions expand into play and fighting. Include descriptions of each behaviour.

Behaviour	Description

# At the Zoo Activities

## Chimpanzee Actives

Observe the chimpanzees for 5 minutes and create a basic ethogram.

Use the sheet overleaf to fill out the ethogram and mark which behaviour is being performed on the minute during the 5 minute observation time. You will need a stopwatch.

Observe and record the facial communication taking place for a period of 5 minutes. After this period, what do these behaviours tell you about the general behaviour of the group?

Using the information provided and the ethogram as support, identify the alpha male. Once the alpha male has been identified, work out the relationship he has with the other individuals within the group. Highlight any possible alliances.

Record any tool use and include information on what the tool is, how it has been modified and why is the tool being used.

Tool use has also been observed in other animals such as capuchins and orangutan. Visit their enclosure and record any tool use you may see.



# At the Zoo Activities

Observe the animals in the mixed African species enclosure; Kingdom of Wild.

Using the information provided on the next page and the basic ethogram below choose 1 of the species and observe them for 5 minutes.

During this observation record any interaction they have with other members of the species. For a further 5 minutes record any interaction with another species. Use the tables below, one for same species interactions and one for different species interactions.

<b>Behaviour</b>	<b>Mark when seen</b>
Approach	
Head rub	
Push	
Social exam	
Muzzle	
Co-feed	
Sentinel	
Resting	

<b>Behaviour</b>	<b>Mark when seen</b>
Approach	
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# At the Zoo Activities

## Basic List of Behaviours

The behaviours below are some of the behaviours you may see being performed in the mixed African species enclosure. This will help you complete the activity on page 20.

**Approach:** One animal moves towards another and stops; must appear to be moving directly towards another animal and have no other apparent reason to enter the area.

**Head rub:** One animal rubs its head on a part of a second animal's body.

**Push:** One animal pushes a second animal.

**Social exam:** One animal sniffs or licks part of a second animal's body other than the muzzle.

**Muzzle:** Two animals make contact between muzzles or sniff each other's muzzles.

**Co-feed:** Two animals eat from the same feeder, branch of a plant or area.

**Sentinel:** One animal approaches 1 or more animals that are lying down and stands in close proximity to them.

**Resting:** One or more animal is lying on the ground.





# At the Zoo Activities

## Flamingo Activities

Head down to the flamingo enclosure between the gelada baboons and smooth coated otters.

Observe the flamingos and answer the questions below.

Can you see any flamingos in friendship groups?

Can you see any courtship displays?

Can you see any interaction involving the mirrors? I.e. nest building or reaction to a reflection.

# At the Zoo Activities

As you go around the zoo, draw any enrichment you can see in any of the animal enclosures.



# Post-Trip Classroom Ideas

These are ideas to help teachers set tasks based on the information provided in this pack.

Explain the various ways in which behaviours can be learnt. Use a word cloud to come up with examples of behaviours that have learnt. Such as; how did you learn to tie your shoes? How did you learn that it's best keep your eyes closed when you're washing shampoo out of your hair?

Can instincts and learned behaviours be related to the environment? For example: bears will go into false hibernation, where the bear will sleep for long periods but will wake up throughout this time. True hibernation is when an animal sleeps for a period of time with no waking periods. Bear hibernation is triggered due to lack of food. Discuss other animals that demonstrate behaviours related to their environment.

Ask the students to create a list of 20 behaviours they do during the day. Which of these are learned and which are instinctive? If they were learned, how did they learn them?

A female tiger instinctively protects her young cubs. However a female turtle lays egg and then has no part in the raising or protection of the eggs or young. Look at why some species raise and protect their young while others do not. Are there any clues in the number of young born or the time it takes to produce more young?

**We hope you enjoyed your trip  
to**



**Learning about  
Animal Behaviour**