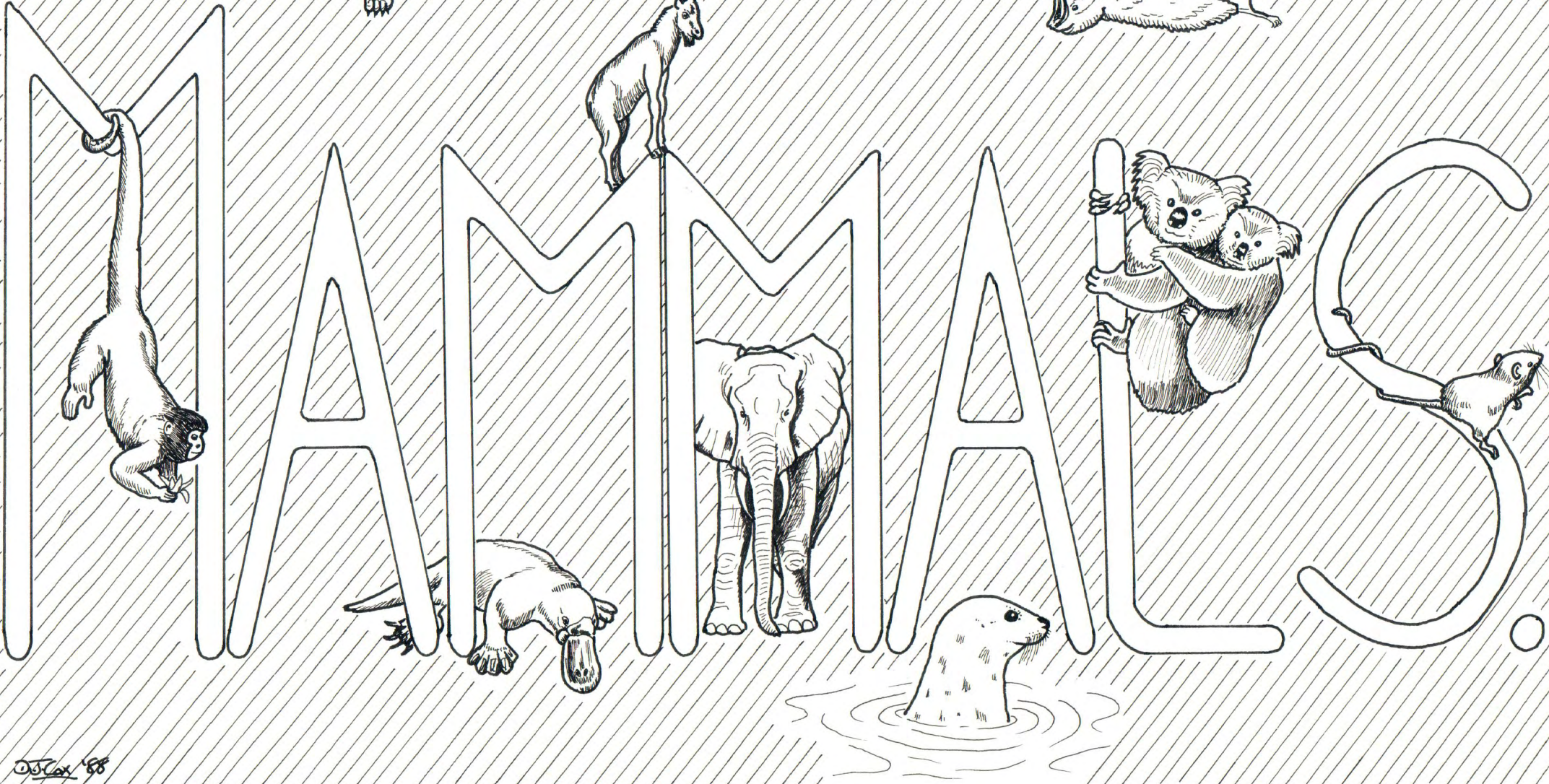
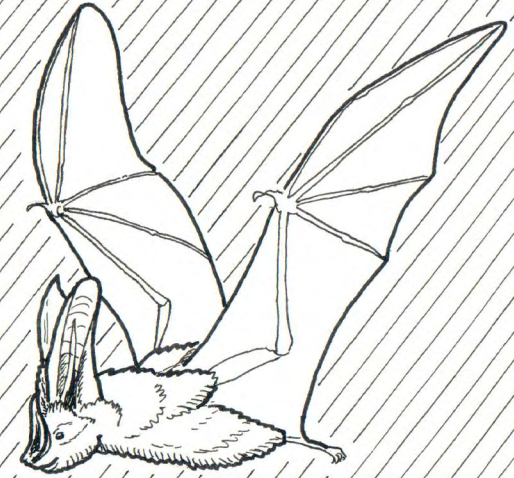
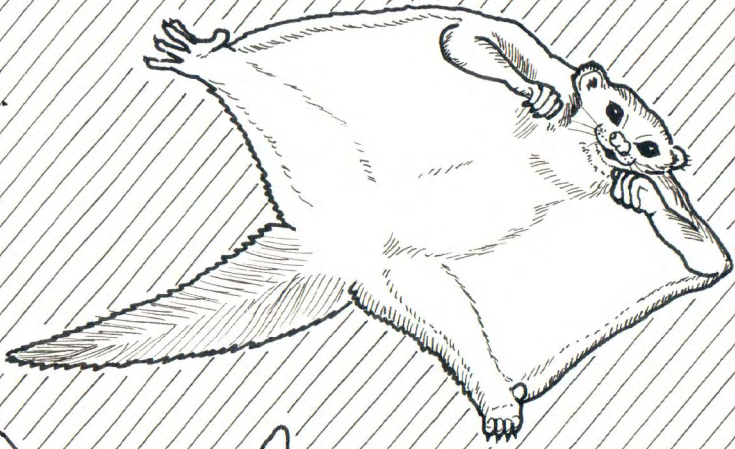


A Teachers Guide To

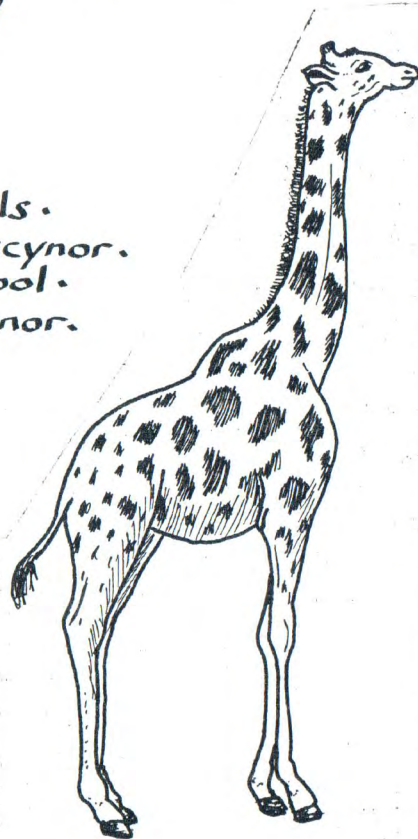
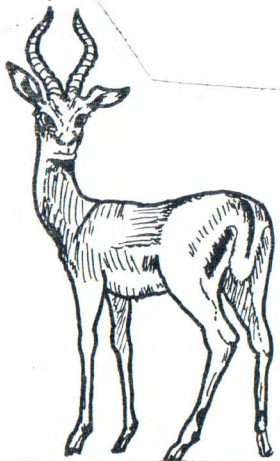


Introduction.

PAGE.

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1. Introduction.
2. Running, Walking, Jumping.
3. Swimming, Digging.
4. Flying, Climbing.
5. Eating.
6. Fur and Hair.
7. Senses.
8. Social Life.
9. Endangered Mammals.
10. Things To Do At Penscynor.
11. Things To Do At School.
12. Mammals At Penscynor.



Mammals.

What is a mammal?

Mammals are:
warm blooded
breathe air
have hair/fur
give birth to live young
feed young on milk.



There are three types of mammal:

1. MONOTREMES - which lay large-yolked eggs.
eg. Duck-billed Platypus,
Short-beaked Echidna.
2. MARSUPIALS - give birth to "embryonic"
young which crawl into the
mothers pouch to develop.
eg. Wombat Opossum
Koala Wallaby
3. HIGHER MAMMALS - the young are well
developed when born.
eg. Monkeys
Deer
Cats
Rodents
Bats
Whales



Reproduced on recycled paper. 1

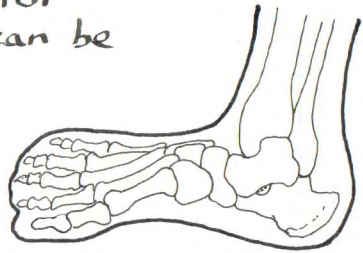
Running, Walking, Jumping.

Flat feet are ideal for walking.

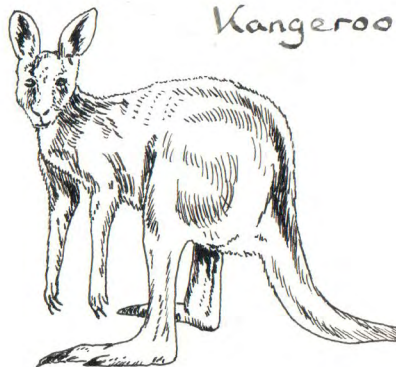
Elephants have broad, flat feet with a fatty layer at the bottom to help spread the weight.



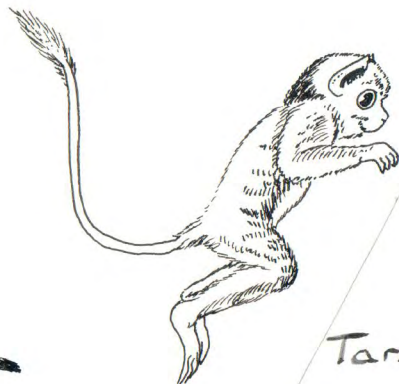
Humans are made for walking. The foot can be held flat on the ground due to the ankle and leg joint being a right angle. So the foot is a weight-bearing arch.



Jumping mammals have large, powerful hind legs, and often have long tails to help them balance.



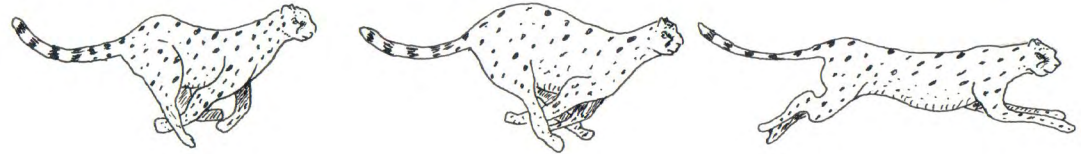
Kangaroo



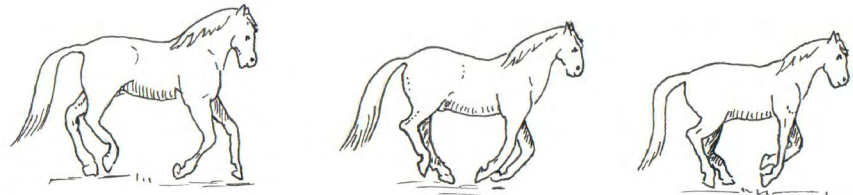
Tarsier

Lots of mammals can run, but if you want speed then a long stride and a fast pace are needed.

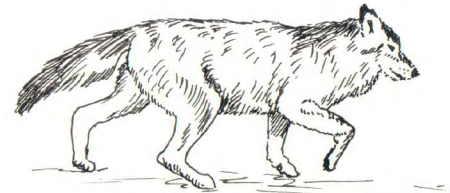
The Cheetah is the fastest land mammal, able to reach 65 mph but only for a short distance (100 to 200 m) before becoming exhausted.



Over longer distances cheetahs can be overtaken by horses.



Some mammals are excellent long distance runners - Wolves can keep up a steady trot for a whole day, and so can cover up to 60 km in one day.



Swimming.

Some mammals are adapted for living in and around water.

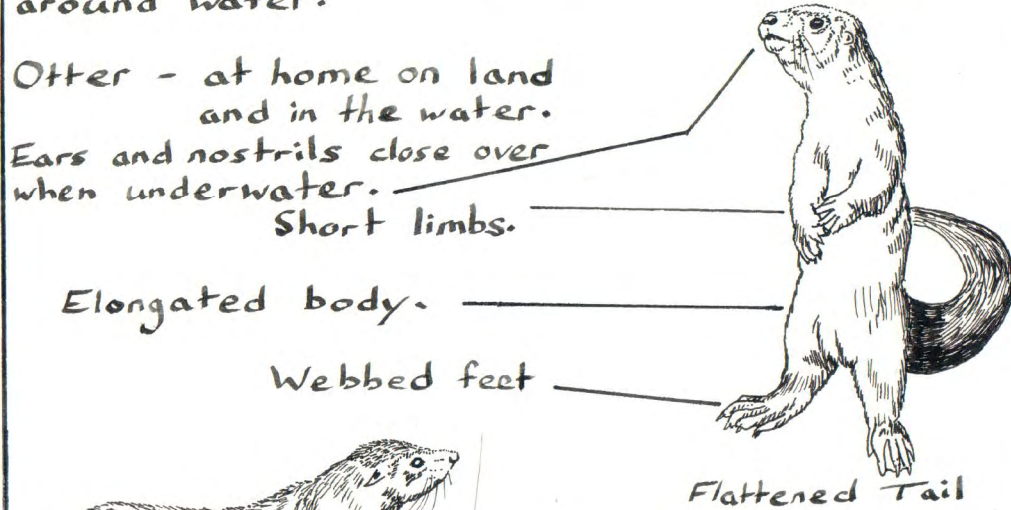
Otter - at home on land and in the water.

Ears and nostrils close over when underwater.

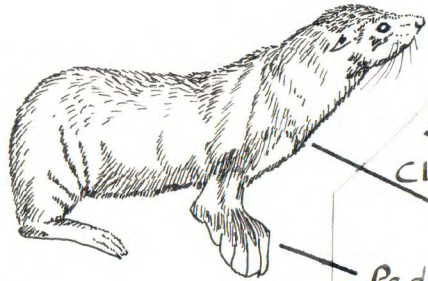
Short limbs.

Elongated body.

Webbed feet



Flattened Tail



SEA LION.

Closeable nostrils

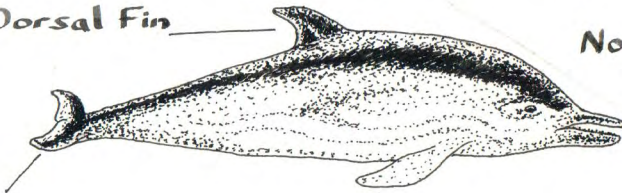
Tapered body

Paddle-shaped limbs

Legs can turn forward for use on land (Seals can not do this).

DOLPHIN. Spends whole life in water, so is specialised to this habitat.

Dorsal Fin



Nostrils on top of head (blow hole).

Streamlined body with no hair

Horizontal tail flukes

Paddle-like forelimbs

Digging.

Some mammals live and feed underground.

MOLE. Lives almost exclusively underground.

Very small eyes.

Able to move forwards and backwards in its burrows as its fur points in all directions.



Large spade-like front paws.

POCKET GOPHER.

Adapted to a life above and underground.

Bulky and short legged

Strong forepaws with powerful claws.



Some mammals dig to get at their food.
GIANT ANTEATER.

The front claws are so large that they have to walk on the sides of their feet.

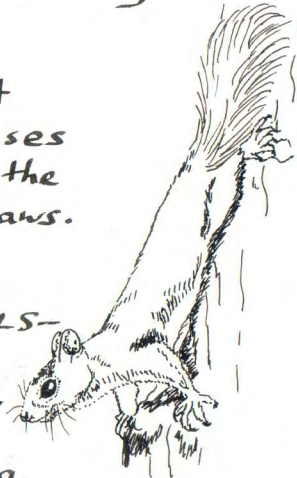


Climbing.

Living in trees has given rise to climbing adaptations.



MARGAY - an excellent climber. This cat uses its whole body and the very long, sharp claws.



TREE SQUIRRELS - use the tail for balance, sharp nails for gripping, and the back feet are used as anchors.



SPIDER MONKEY - many monkeys spend most of their lives in trees. Gripping tail (in most S. American species) Hand-like feet.

To climb up and down mountains some mammals have developed feet with excellent grips.



CHAMOIS - the hooves have a rubber-like sole for a sure grip on steep, rocky mountain sides.

Flying.

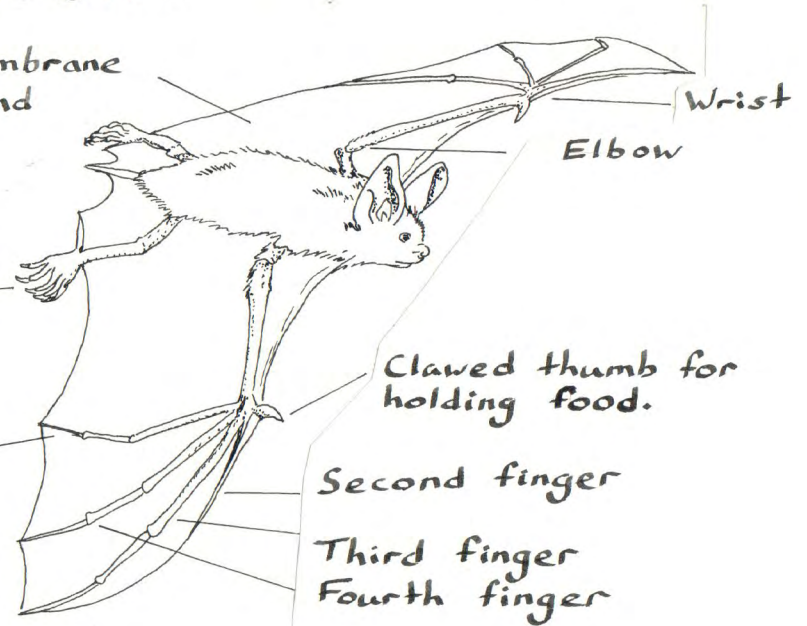
The only mammals with powered flight are the bats.

A TYPICAL BAT -

Wing membrane of skin and elastic tissue.

Foot with 5 toes

Fifth finger



Clawed thumb for holding food.

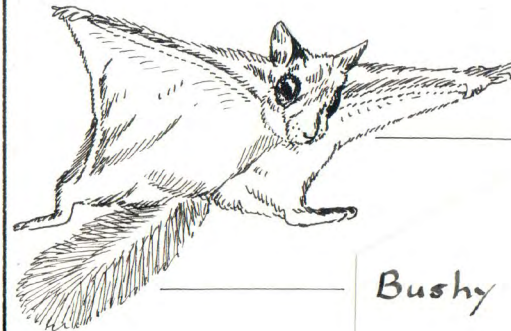
Second finger

Third finger

Fourth finger

Some other mammals are capable of gliding and have developed skin flaps between the limbs to aid them.

FLYING SQUIRREL -



Furry gliding membrane between limbs.

Bushy tail used as a rudder.

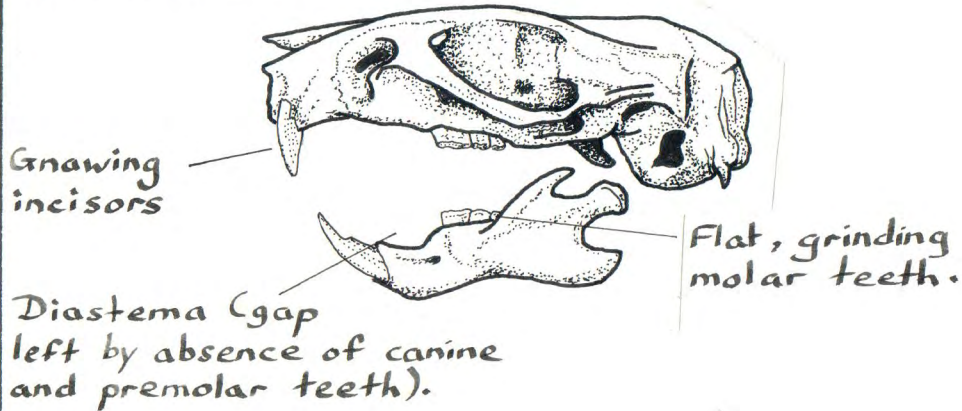
Eating.

Mammals have such a diverse range of foods, so many different specialisations can be found.

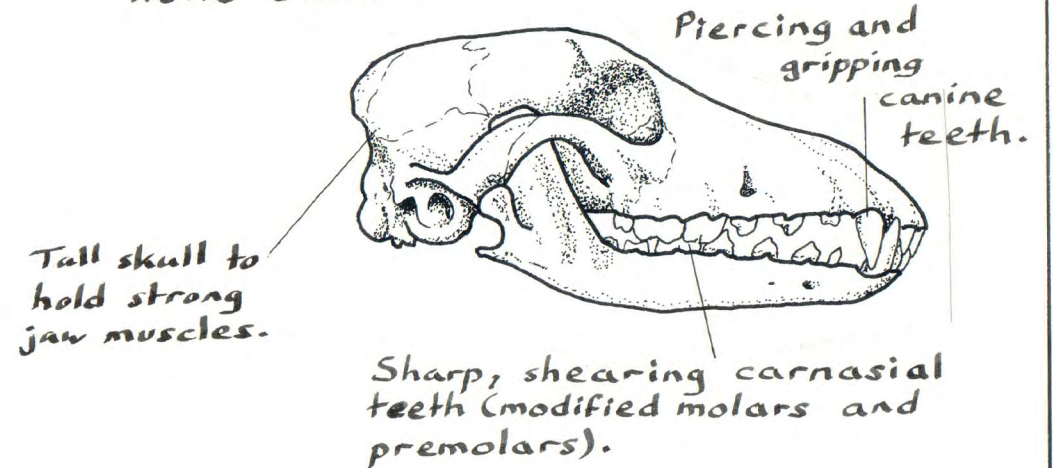
HERBIVORES - teeth are adapted for eating plant material.

CARNIVORES - teeth are adapted for ripping and tearing meat.

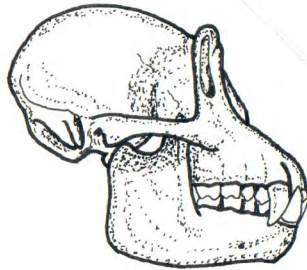
Rats' Skull -



Wolfs' Skull -



Chimpanzees' Skull -

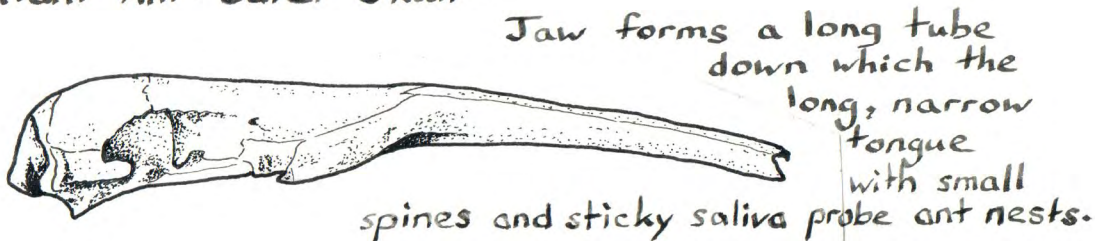


OMNIVORES - eat both plants and animals, so the teeth are not adapted to any extreme.

Shovel-shaped incisors and fairly flat molars show a predominance of plant food in the diet.

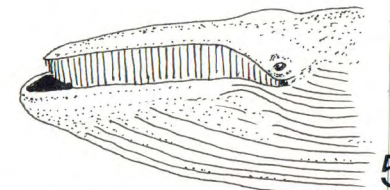
MAMMALS WITH NO TEETH - some are so specialised that teeth would be of no use.

Giant Ant-eater Skull -



Blue Whale.

Some whales filter feed on krill (a shrimp-like animal) using baleen plates which hang curtain-like in the mouth.

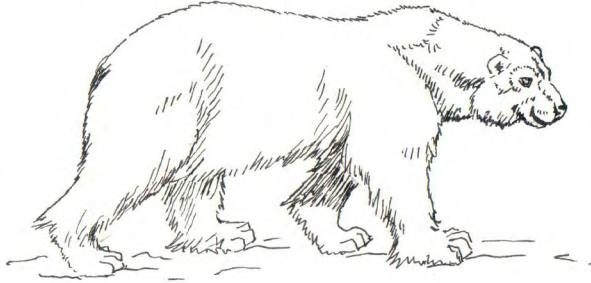


Fur And Hair.

Fur and hair are probably the most distinguishing features of mammals. Here are a few examples.

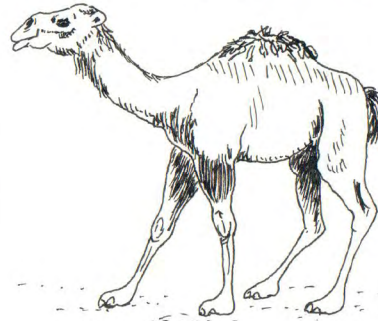
KEEPING WARM -

The Polar Bear has long, transparent, hollow hairs which transport the sun's heat down to the black skin which absorbs the heat. The long hairs trap the heat in a layer of air next to the skin.

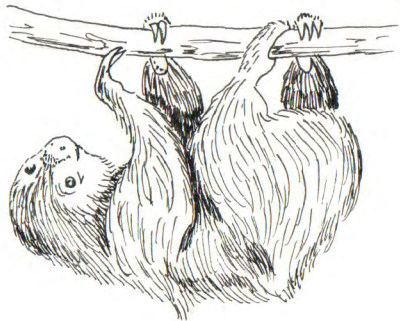


KEEPING COOL -

Dromedary Camel has long fur on top to protect it from the sun's heat, and short hairs underneath to allow the body to lose heat.



KEEPING DRY - long hanging fur or short overlapping fur simply allows water to drip off. Eg. Sloths, who spend their lives hanging upside down in rainforests, have fur which hangs from the stomach to the back!

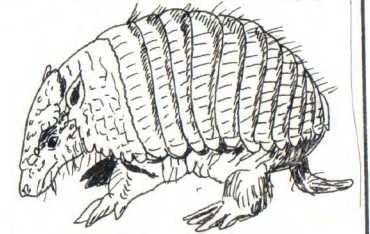


FOR DISPLAY - Ring-tailed Lemurs use their tails to signal to each other.

Bright colours, bold patterns, manes etc. are all used by mammals for display.

FOR DEFENCE -

The Armadillo has the top part of its body covered in bony plates which protect it when it curls up in a ball.



Porcupines have spines made out of hair. These have barbed ends which are pushed into any attacker.



TO HIDE - the black stripes on straw-coloured fur give the Tiger excellent camouflage in tall grass.

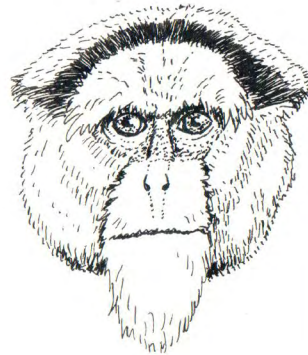
Senses.

SIGHT - vision in mammals ranges from blindness (eg. Golden Mole) to the excellent night vision of nocturnal mammals.



Night vision is often aided by large eyes and a reflective layer (tapetum) in the eye - the eyes shine when light shines on them.
Eg. Bushbaby.

Forward-facing eyes give binocular vision for good distance judgement
Eg. Monkeys.



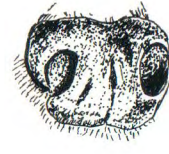
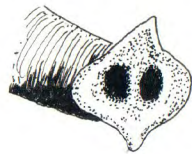
TOUCH - useful when sight is diminished for some reason.

Whiskers - found on the face of many mammals are touch sensitive.

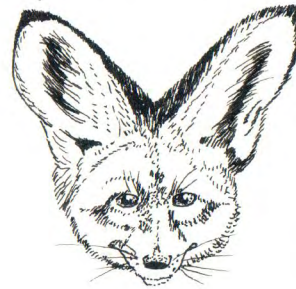


Fingers - primates have touch sensitive digits to help manipulate food, and to help in gripping branches.

The Duck-billed Platypus has a touch-sensitive bill.



SOUND - most mammals have good hearing, but some have exceptional hearing.



Bat-eared Fox has large ears (up to 12cm long) for locating insects.

Bats use sound (echolocation) to navigate, feed and find roosts - so they have highly acute hearing.



SMELL - most mammal smells (from glands, urine etc) are used to mark out territories, so

preventing any unnecessary clashes of individuals or groups.

Sense of smell ranges from excellent (eg. tracker dogs) to fairly poor (eg. bats, humans) Smell is also used for defence - eg. Skunks.

TASTE - is not a major sense in mammals, taste buds are found on the tongue.

SIXTH SENSE - Whales and dolphins can sense ("see") the Earth's magnetic field, and navigate by following a magnetic map of the ocean floor.

Social Life.

Many mammals live in social groups: Lions are the most social of cats, they live in family groups (prides) of 4 to 12 related adult females, their offspring, and 1 to 6 adult males.



Elephants live in herds of closely related adult females and their young. This group is led by the oldest female. Adult males live alone or in small, temporary groups.



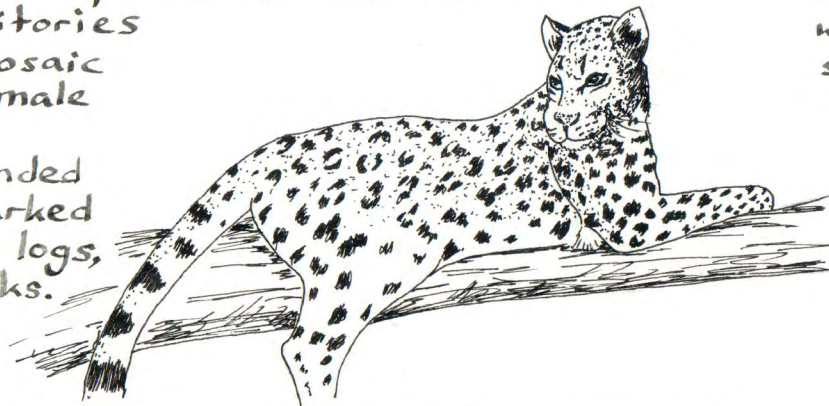
Gibbons live in small family groups of an adult pair and usually two youngsters.



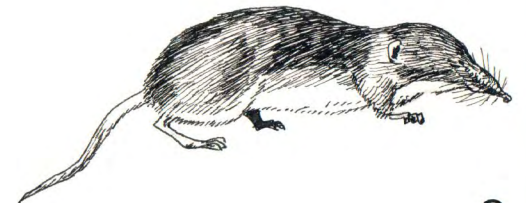
Meerkats live in packs of about fifteen individuals; each taking turns to keep watch, look after the young, dig new burrows etc.

Many mammals are solitary, and are aggressive towards other individuals. This is a measure to keep competition for food, mates etc. to a minimum. The leopard is almost entirely solitary. A female's territory will barely overlap that of another female, but their territories are overlapped by a mosaic of similar but larger male territories.

These areas are defended by fighting; they are marked with urine sprayed onto logs, branches and tree trunks.



When two Common Shrews meet they attack each other vigorously with a lot of high-pitched squeaking, until one submits or is killed.



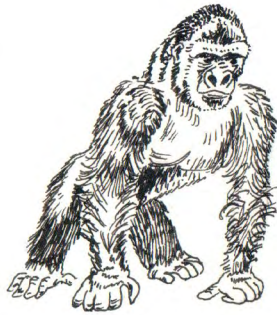
Endangered Mammals.

Extinction occurs naturally, Dinosaurs and Mammoths for example; but recently more and more animals (and plants) have become extinct due to the actions of humans: Habitat destruction. Hunting. Trade in live and dead species. Competition from introduced species. Today there are over 320 species of mammal staring extinction in the face.

MAMMALS IN DANGER include:

Tiger - threatened by habitat loss and hunting. Protection in some areas of India has led to an increase in the Indian race.

Gorilla - classified as vulnerable (the Mountain race is endangered), mainly due to habitat loss and hunting.



Whales - overhunting has resulted in very small populations.

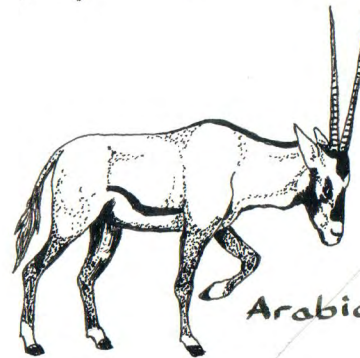
Rhinoceros - all five species are threatened, two are on the brink of extinction due mainly to trade of the horn as an aphrodisiac and medicine in Asia and dagger handles (a status symbol for men) in North Yemen.



White Rhinoceros



Black Rhinoceros



Arabian Oryx

GONE FOR EVER:

Stellers' Sea Cow - discovered in 1741, the last one was killed in 1768 - just 27 years to exterminate an entire species.

Quagga - extinct since 1883 its small range and too much hunting caused its decline.

Thylacine - this dog-like marsupial has been classified as extinct since 1933. But reports of sightings still occur today.

CONSERVATION -

can be achieved by preservation of habitats, laws preventing hunting and trading of wild animals, and breeding and reintroduction programmes. Also education and research play important roles.



Golden-lion Tamarin

**Sorry, the real
page 10 has been
lost.**



Bad gnus travel fastest

Things To Do At School.



HUMANS
ARE
MAMMALS!

Write a poem about mammals.

Write a story about endangered mammals eg. Whales, Elephants.

Make masks, ears, tails etc. from paper, cardboard, string etc.

Make up a dance based on various animal movements, you could make up the music too.

Make popularity poles from your class, or year, or school. Then make graphs to show which is the least and most favourite mammal.

Choose a mammal and design an enclosure for it/them. Take into account where it would live in the wild, its social life, what it eats etc. How are you going to clean the enclosure - make sure that keepers can do so in safety.

Find out about British mammals past and present.

Create a mammal of the future.

Write to conservation groups about endangered mammals:

W.W.F. 11-13 Ockford Rd. Godalming
Surrey GU7 1QU.

Young Batworker, 5 Manor Rd, Tankerton,
Whitstable, Kent CT5 2JT

Glamorgan Badger Group, G.W.T. Centre,
Tandu, Mid Glamorgan.

Make models -
plasticine
clay
pipe cleaners
etc.

USEFUL

Attenborough D. (1979).

Attenborough D. (1984).

Corbet & Ovendon. (1980). Mammals Of Britain And Europe. Collins.

Corbet & Southern. (1977). The Handbook Of British Mammals. Blackwell.

Downer J. (1988).

Macdonald D. (1984).

Mitchel Beazley. (1986).

Readers Digest. (1978). The Living World Of Animals.

BOOKS.

Life On Earth. Collins.

The Living Planet. Collins.

Collins.

Blackwell.

Supersense. BBC.

Encyclopaedia Of Mammals.
Vols. 1 and 2. Guild.

The World Of Animals.

Useful Locations

The Zoo Centre is located next to Penguin Pool (7), between Burger Bar (4) and Waterfowl aviary (22)

1. Main Office
First Aid Point
Gift shop
Copper Kettle Coffee Shop
2. Toilets
3. Toy Shop
Ice-Creams
4. Burger Bar
5. Book shop / Sweet shop
6. Picnic Area

Enclosure key

 = Mammals

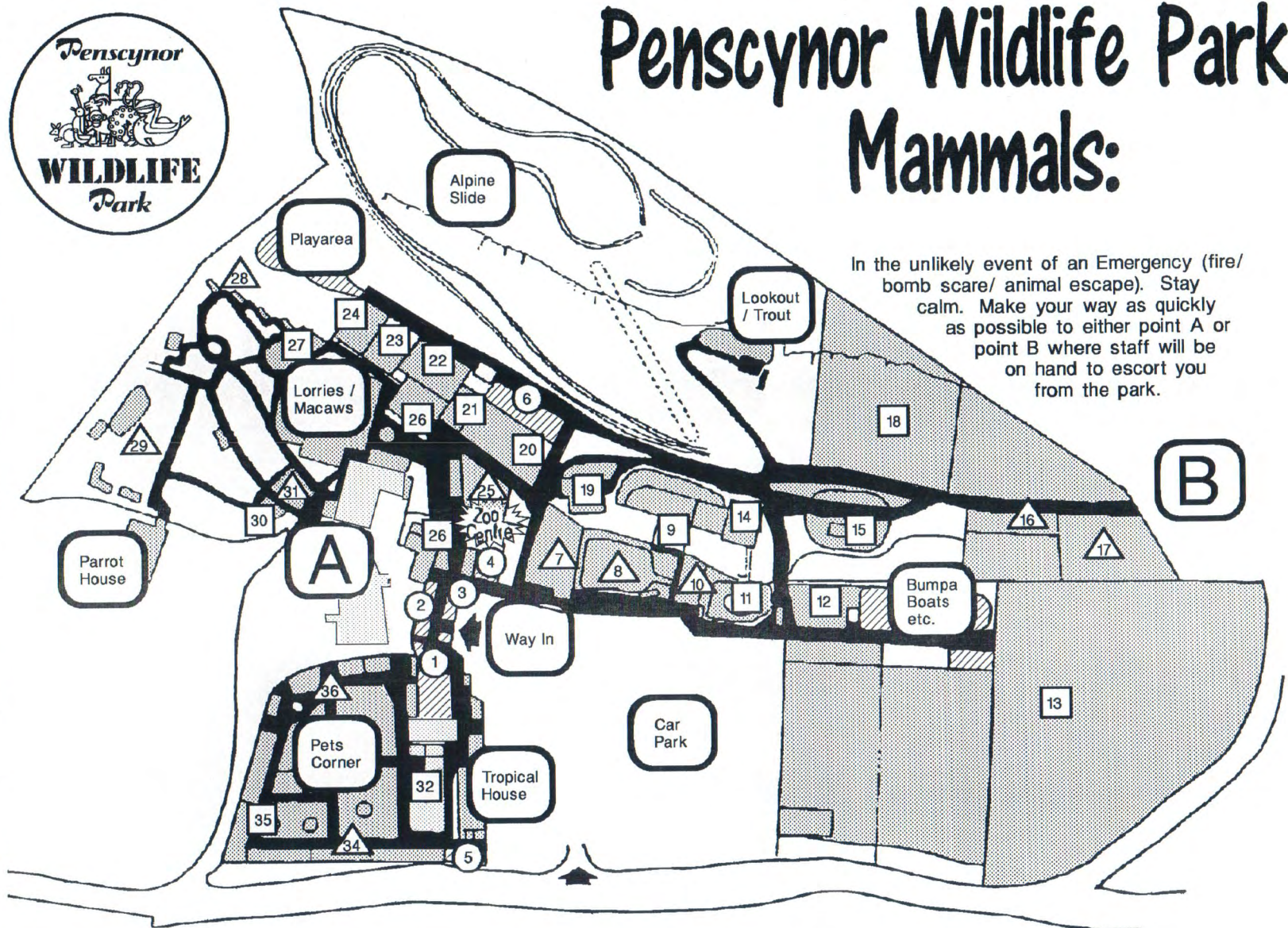
Guide Books - Available from gift shops and main entrance.



Penscynor Wildlife Park

Mammals:

In the unlikely event of an Emergency (fire/ bomb scare/ animal escape). Stay calm. Make your way as quickly as possible to either point A or point B where staff will be on hand to escort you from the park.



7. Penguins
Pelican
8. Waterfowl
Trout
Squirrel Monkeys
9. Chimpanzees
10. Scarlet Ibis
White Fronted Wood-Duck

- | | |
|--------------------------------------|-------------------------------------|
| 11. Gibbon Island | 15. Emperor Tamarin Island
Trout |
| 12. Meerkats | 16. Rheas |
| 13. Shetland Pony
Guanaco
Deer | 17. African Crowned Crane |
| 14. Black & White
Ruffed Lemurs | 18. Wallabys
Muntjac |
| | 19. Marmoset House |

- | |
|--------------------------------------|
| 20. Prairie Dogs |
| 21. Pygmy Goats |
| 22. Western-Black & White
Colobus |
| 23. Lar Gibbons |
| 24. Ring-Tailed Lemurs |

- | |
|----------------------------------------------------------------------|
| 25. Sacred Ibis
Night Herons
Silver Gulls
Demoiselle Cranes |
| 26. Sooty Mangabeys |
| 27. Asian Short-Clawed Otters |
| 28. Hillside Parrot Aviaries |

- | |
|----------------------------------------|
| 29. Flamingos |
| 30. Porcupines
Mongoose |
| 31. African Fish-Eagle |
| 32. Eastern Black and White
Colobus |
| 33. There isn't a 33! |

- | |
|--------------------------------------------|
| 34. Mixed Aviaries |
| 35. Farm Animals
Rabbits
Guinea Pigs |
| 36. Mixed Aviaries |