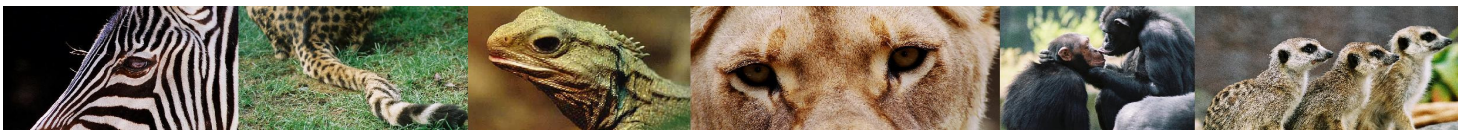


Primates

At

Wellington zoo





Welcome

This booklet has been designed to facilitate students working towards Achievement Standard 8.2(b) and 8.2(c): Describe trends in human evolution.

We have 9 primate species here at the zoo - the most diverse collection in New Zealand. This provides students with an amazing opportunity to observe examples of Prosimians, Old and New World monkeys and a lesser and great ape.



Contents

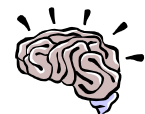
- Chapter 1 The primate family tree and general primate features
- Chapter 2 The Prosimians; Features of the group and information on our Black and white Ruffed Lemurs
- Chapter 3 New World monkeys: Features of the group and information on our Cotton Top Tamarins, Capuchins and spider monkeys
- Chapter 4 Old World monkeys: Features of the group and information on our Baboons
- Chapter 5 Lesser apes: Features of the group and information on our white cheeked gibbons.
Great apes: Features of this group and information on our chimpanzees
- Chapter 6 Early bipedal hominins: Discussion of the evolutionary pathway and features of the key groups
- Chapter 7 Observation sheets that can be used around the zoo
- Chapter 8 Revision checklist

Meanings of symbols



Type of habitat and country/area of origin

Brain weight



Diet

Body weight



Gestation length

Interesting/unusual facts

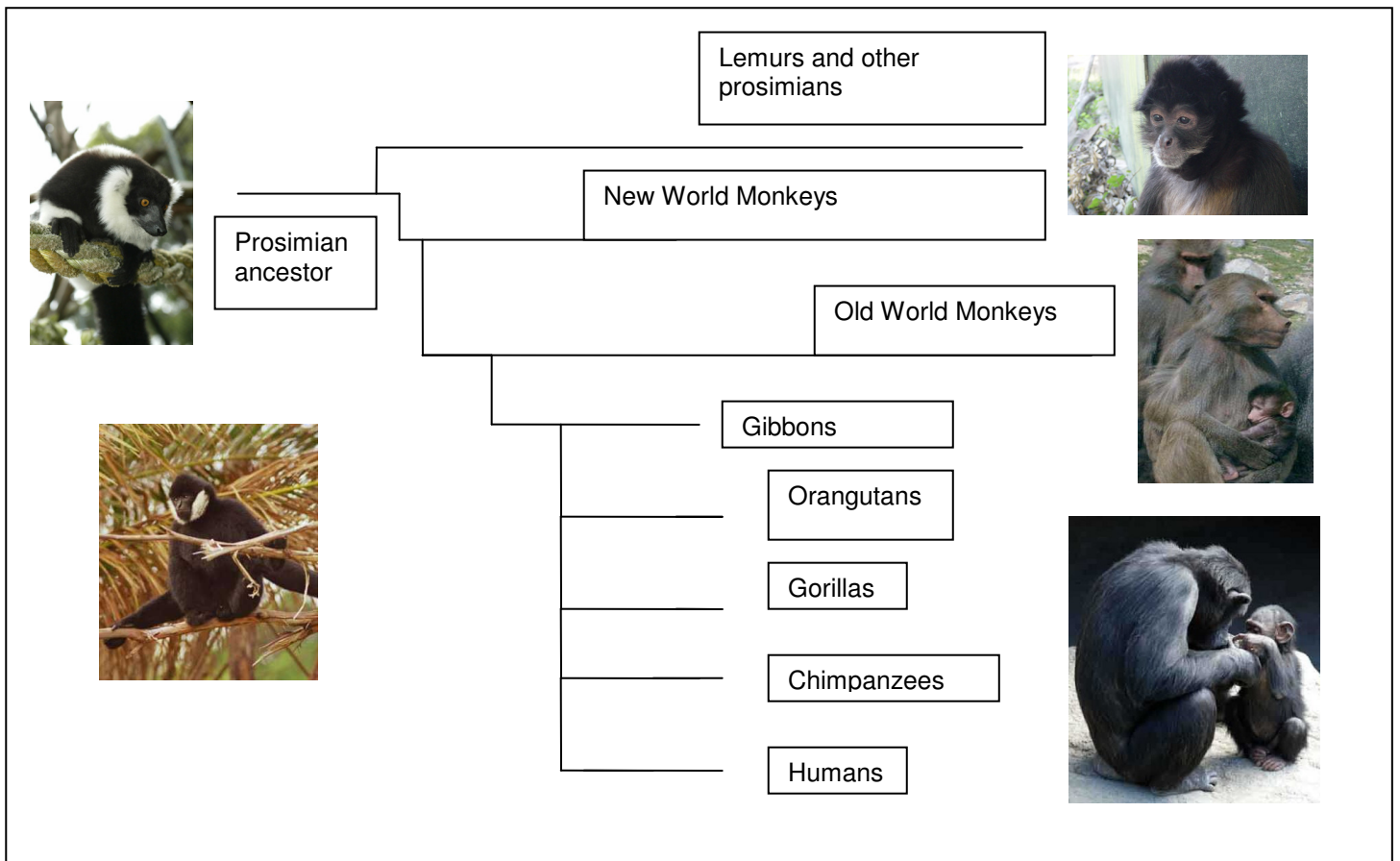


Infant development



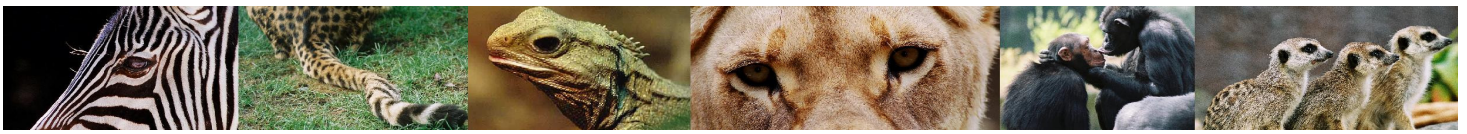


Chapter 1: Primate Family Tree



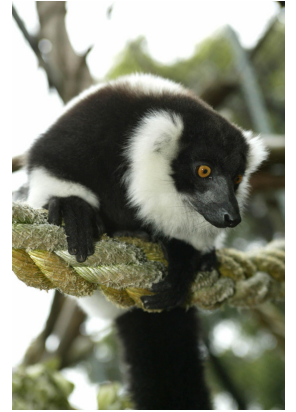
Features of primates

- 5 digits on hands and feet (pentadactyl)
- Nails on at least some of the digits in all modern primates
- A grasping / prehensile ability in hands or feet
- Generally erect body posture
- A clavicle to give a flexible shoulder joint
- A generalised dental pattern - especially in back teeth
- More emphasis on vision and less on smell
- Relatively long gestation periods
- Single births are normal with longer parental investment as there is more learned behaviours






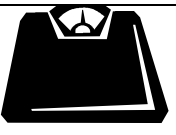



Chapter 2: Prosimians

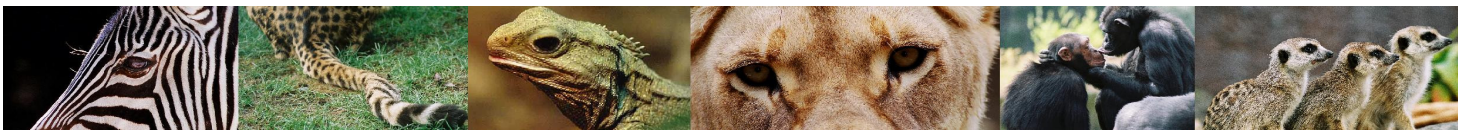
- Oldest group of primates
- Mainly nocturnal (lemurs are exceptions)
- Moist noses
- Depend more on smell than other primates
- Sensitive whiskers
- Multiple pairs of nipples so capable of litters of young
- Found in Asia and Africa
- Many are solitary
- Use scent glands to mark territories
- Have a tapetum (Reflective layer in the eye) to enhance night vision
- Group includes- lemurs, pottos, lorises and bushbabies



Black and white ruffed lemurs

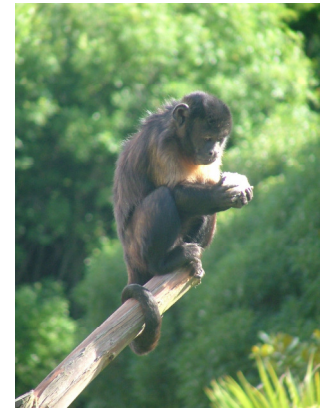
	Primary rainforest in Madagascar
	Fruit, seeds, leaves and nectar
	90-102 days
	Infant: 30 days Weaning : 90 days Sexual maturity: 20 months
	34.2g
	3.5kg
	Diurnal and arboreal they rarely move on the ground Territorial Quadrupedal Live in variable social groups of between 5-16, sometimes even 32 Average lifespan is around 19 years. Females are generally the dominant sex — they get the best choices of food, defend the group and choose whom they mate with.

We have 2 sisters, Favia and Fiona who came from Hamilton zoo. They are not part of a breeding programme as their genes are well represented within New Zealand.



Chapter 3: New World Monkeys

- Smaller than Old World monkeys
- Found in Central and Southern Americas
- Nostrils wide apart and openings face outwards
- Flattened nose
- Tree dwelling
- Use all 4 limbs to move, some have prehensile tail
- 2 key groups- Marmoset/ tamarins and Cebids







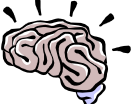


Callitrichidae, (Marmoset/ Tamarins)

- Smallest of monkeys- under 1kg
- Tamarins are similar to marmosets but don't have ringed tails and live in smaller groups
- Have claws instead of nails, to help them to climb
- Only 1 female in group will breed
- Most species produce twins
- Parental care is shared

Cebids, (Capuchins, spider monkeys, Sakis and howler monkeys)

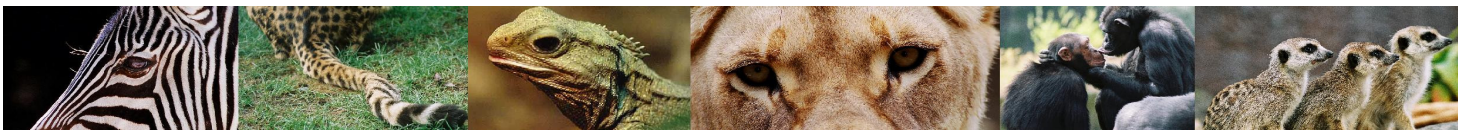
- Prehensile tail
- Heavier bodied than Callitrichidae

Cotton Topped Tamarins





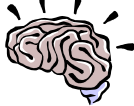


	Secondary forests in South America
	Fruit, leaves and seeds as well as insects, mice and birds
	140 days
	Infant: 1-7 months Wean: 7 months Sexual maturity: 18 months
	9g
	430g
	Female carries offspring for 1-2 weeks before the male takes over the task entirely. Stand bipedally to display aggression and dominance



We have 1 group within the zoo which is comprised of mum, dad and their 4 sons.

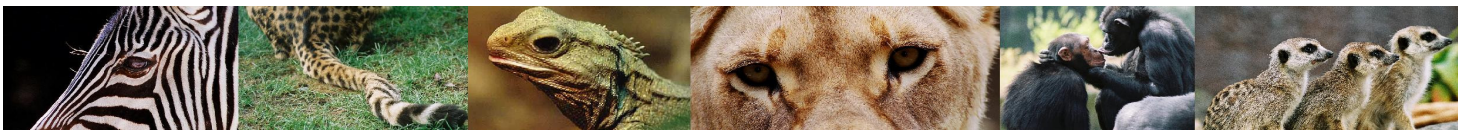


Brown Capuchins








	Tropical rainforests of Central and South America
	Fruit, leaves, shoots and insects. Sometimes even reptiles, birds and small mammals
	149-158 days
	Infant: 0-6 months Weaning: 1 year Sexual maturity: Female 84 months Male 56 months
	71g
	1.3-4.8kg
	Said to be very intelligent as have to search for hard to find food that are available for only a short time. Live in groups



Our capuchin group consists of 14 individuals – 10 males and 4 females. Almost all of them have been born here at Wellington. The oldest is Kelly, born 1986. She is the dominant female and has a missing finger. The dominant male is Doyle, born in 1991. The youngest is Topi, born 2001.



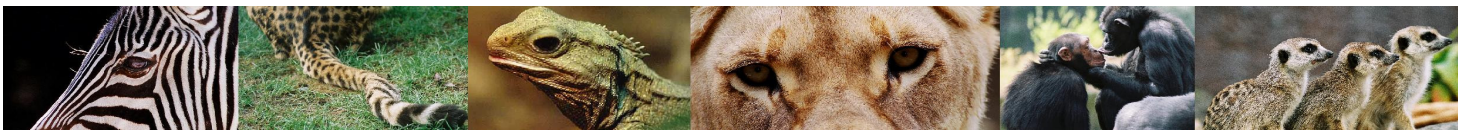
Spider Monkeys

	Tropical rainforests of Central and South America
	Fruit, leaves, seeds and nuts
	220-236 days
	Infant: 0-24 months Wean: 18-24 months Sexual maturity: 2-5 years
	730-980g
	7.2-10.4kg
	Long limbs and tail which helps to make them very agile. Reduced thumbs so each hand is like a hook to help them swing through trees.

There are 7 spider monkeys on Monkey Island. Jackie Chan is our only male, he was born in 2003. You will notice colour variations within the group in the same way humans show hair colour differences.

Most of the spider monkeys have been born here at the zoo.







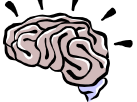
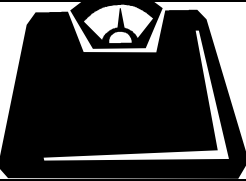



Chapter 4: Old World Monkeys

- Largest and most diverse group
- Larger than New World monkeys
- No prehensile tail
- Often have leathery sitting patches on their rumps, (ischial callosities)
- Nostrils close together and facing down
- Representatives found in Africa and Asia
- Diet depends on their habitat
- Two main groups- Cheek pouch monkeys and leaf eating monkeys



Hamadryas Baboons

	Grasslands and open rocky country of North East Africa and Arabia
	Fruit, leaves, stems, roots, pith and small animals. They can store food in their cheek pouches
	165-174 days
	Infant: 0-15 months although dependent on mother till 2 years old Sexually mature: 4.5 years
	142g
	12-21kg
	They have a four level social structure. An adult male dominates a group of up to 10 females called his harem. Two or more of these units, with single male followers, make up a clan. Several clans make a band, and several bands together form a troop. They have large canine teeth - a troop of baboons is capable of killing a leopard Males stay with their birth clan whilst females move away They spend more time on the ground than any other monkey

Our baboon troop is made up of 16 individuals these are divided up into 3 different harems. Albert, Les and Taila are the harem leaders. Les and Taila have only 1 female each in their harem and Albert has 7 females in his harem. Many of the troop members were born at Wellington Zoo.

WELLINGTON

ZOO







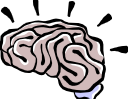


Chapter 5: Apes

- Includes humans
- Come from Southeast Asia or central Africa
- Have no tail
- Larger bodied than monkeys
- Short broad nose
- Large brain size relative to body size
- More reliant on vision rather than smell
- Divided into 2 groups- Lesser apes and Great apes
- More upright posture and broader chest
- Long periods of parental care



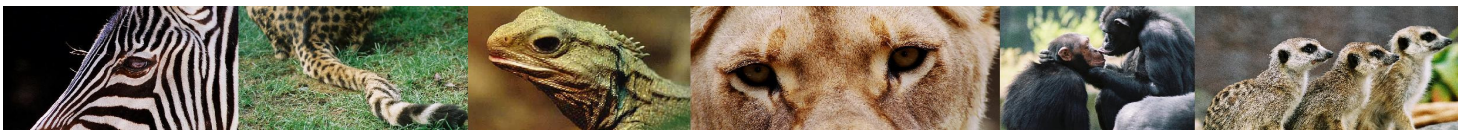
Lesser apes (Gibbons)

White cheeked gibbons





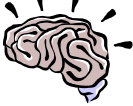


	Tropical broadleaved forests of China
	Fruit
	210 days
	Infant: 18-24 months Weaning: 18-24 months Sexually mature: 6-7 years
	About 110g
	5.6kg
	Monogamous and will sing to each other. The female starts first and the female answers. Long forearms and hooklike fingers for swinging Very shy species



Vilson, our male, came here in 1991 aged 14 from Melbourne and Robyn, our female, from Perth Zoo in 2005. Their courtship involves vocalisations. Robyn often starts it with a wu, wu call and Vilson follows it up with a long OOOOO call.



Chimpanzee

	Tropical forest, wood land and savannah of Africa
	Fruit, leaves, animals Eat over 250 different types of food.
	240 days
	Infant: 5 years Weaning: 4 years Sexually mature: Female:11 years Male: 13 years
	410g
	32-60kg
	Chimps travel mostly on the ground but feed in the trees during the day Make nests to sleep in at night up in the trees Chimps from different areas use different tools Alpha male is in charge of group



Wellington Zoo has had chimpanzees since 1956, bringing in the first animals from London Zoo for chimp tea parties.

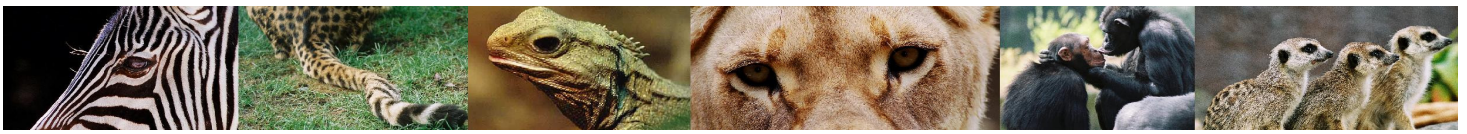
Currently at the zoo we have 11 chimps- 5 male and 6 female. The youngest is Beni, born 22nd October 2007. The oldest is Sam, born 22nd August 1977, and the largest is Jessie, born 10th July 1978. She is a very determined and intelligent lady who likes to paint. Marty is the alpha male, he can be recognised by the large ears that stick out of the side of his head.



Chapter 6: Bipedal hominins

There are many theories about how homo sapiens have evolved and our distant relatives. One of the amazing and frustrating things about the topic is that nobody can say categorically which species lead to another species and so on. This page provides some of the key information about some of the generally accepted homo sapien ancestors

	A. afarensis	H.habilis	H. erectus	H. heidelbergensis
Age	4.0-3.0 mya	2.4-1.5 mya	1.8 mya-300,000 ya	600,00-250,000 ya
Brain size (cc)	380-450	500-800	750-1225	1000-1300
Height (m)	1.1-1.7	1.3		
Diet	Probably omnivorous. We know feed on range of plant material	Large amount of meat in diet but more of scavenger	Omnivorous- hunter significant amount of meat in diet	Omnivorous- hunter/ scavenger.
Skull comments	Similar to chimp but more human teeth	Larger cranium than afarensis, angled face. Evidence of speech bulge in the brain, strong teeth	Prognathous face, projecting nose and no chin Brow ridges and strong teeth and jaw	Low brow ridge, receding foreheads and weak chins. Almost flat face with sloping forehead
Extra info	May have used some tools like chimps but no record. Wrist bones show capable of knuckle walking as well as bipedal	Tool usage Bipedal	Tools and fire Bipedal	Smaller and more specialised tools. Fire and construction of shelters. Bipedal



Primate Observation: Frequency of behaviour

To carry out this observation you may want to work in pairs, one person to observe the animal and the other to time and tick the sheet. Observe an individual primate for 10 minutes and after each 60 second interval put a tick in the box of the behaviour they are carrying out at that time. Repeat with another individual primate.

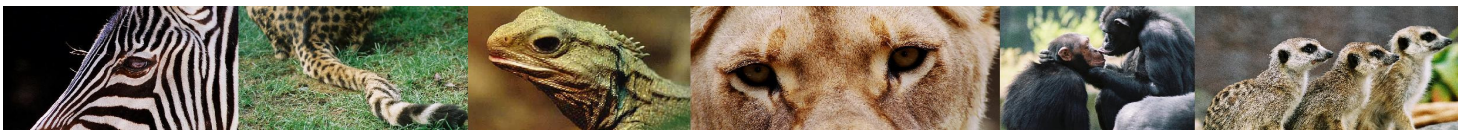
Name of primate 1 _____

Sex: M F

Name of primate 2 _____

Sex: M F

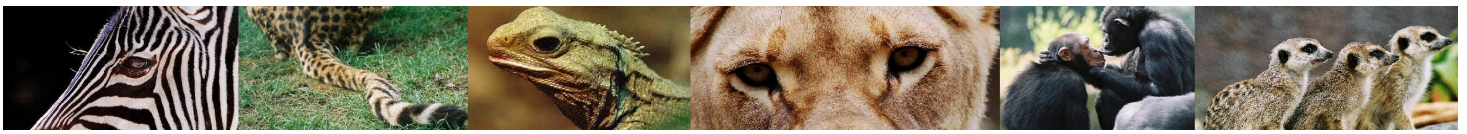
Category of behaviour	Action	Observation 1 Ticks	Observation 2 Ticks
Grooming	Self grooming		
	Same sex grooming		
	Male/female grooming		
Communication	Aggressive facial display		
	Aggressive action		
	Aggressive noise		
	Submissive action		
	Retreat		
	Pant hooting		
	Communicating with a human		
Care of young	Mother feeding young		
	Mother carrying young around		
	Mother grooming young		
	Other females interacting with young		
	Males interacting with young		
Locomotion	Climbing		
	Brachiation		
	Knuckle walking		
	Bipedalism		
	Remaining still		
Tool use	Use of sticks		
	Use of stones as weapons		
Play	Young playing together		



Physical characteristics of primates:

Complete the table as you observe the different primate groups

Observe	Prosimian-Lemur	NW Monkey	OW Monkey	Ape	Human
Length of forelimbs relative to hind					
Tail: present, length, furred, prehensile					
Snout: pointed, round or flattened					
Nostrils: position on snout, spacing and direction					
Eyes: facing forwards or sideways					
Brow ridges: how prominent if present					
Hands and feet: Length of digits, opposable					
Sitting patches or furry buttocks					



Chapter 8: Revision check list

The red, amber and green system is to help you to keep track of your revision. When you start your revision go down each of the tables and tick the box that most applies to your knowledge about that topic.

Red: Can't really remember anything about it or don't understand it

Amber: Understand some of it but have questions and need to read and learn more

Green: Understand it fully **AND** can answer exam questions on it

As you do increasing amounts of revision more ticks will appear in the amber and then the green boxes. The aim is that by exam time all the green boxes will be ticked. Good luck.

Describe the evolutionary trends of the following features in hominid skulls, remember to include an ape comparison

	Red	Amber	Green
Brain size			
Zygomatic arches			
Forehead shape			
Mandible			
Broca's and Wernicke's areas			
Prominence of brow ridge and chin			
Degree of prognathism and facial angle			
Size of teeth and enamel thickness			

Describe evolutionary trends of the following features in hominid skeletons related to bipedalism, remember to include an ape comparison

	Red	Amber	Green
Height			
Position of foramen magnum			
Shape of spine			
Shape of pelvis			
Length of femur			
Foot shape			
Toe shape and positioning			
Forelimb length			
Valgus angle			

Describe evolutionary trends in the following features of hominid hands, remember to include an ape comparison

	Red	Amber	Green
Thumb length			
Finger shape and length			
dexterity			

Describe key features of the following species

	Red	Amber	Green
Australopithecus afarensis			
Paranthropus spp.			
Homo habilis			
Homo erectus			
Homo heidelbergensis			
Homo neanderthalensis			