

Student Notes

These pages will assist you in your note taking during the Primates presentation.

1. Summarise the key characteristics of living primates:



2. Describe two evolutionary trends observed in the primate order:

A) _____

B) _____



Past and Present Primates

Human Biological Science: Unit 4 (ATAR)

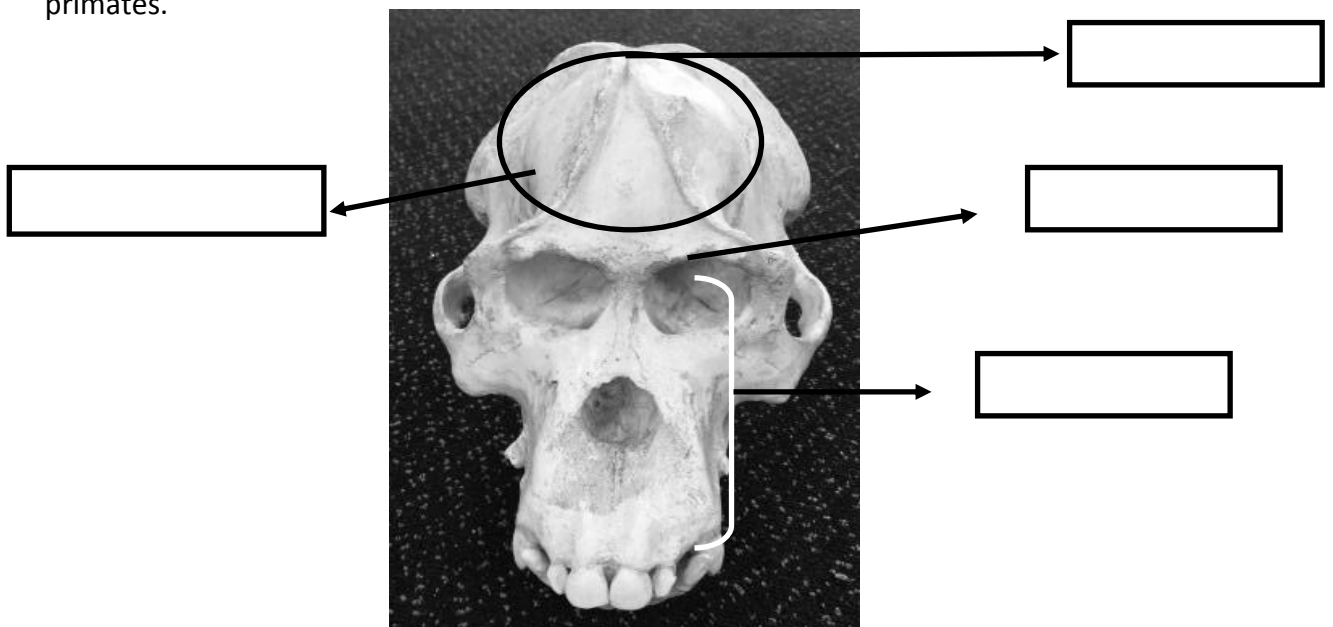
3. Shared characteristics of the Great Ape Family.

Characteristic	Description

4. Despite many genetic similarities between members of the Great Ape Family, small differences in DNA sequences can have a great effect on form and function. Can you describe an example of this?

5. Differences in the Great Ape Family—Comparative Anatomy.

Label the features of this Orangutan skull that are used for a cranial comparison between primates.



Past and Present Primates

Human Biological Science: Unit 4 (ATAR)

6. Summarise the differences between Non Human Great Apes and Humans in the table below.

	Non Human Great Apes	Humans
The Skull		
Dentition and Prognathism		
Mobility of Digits		
Gestation and Parental Care		
Locomotion		

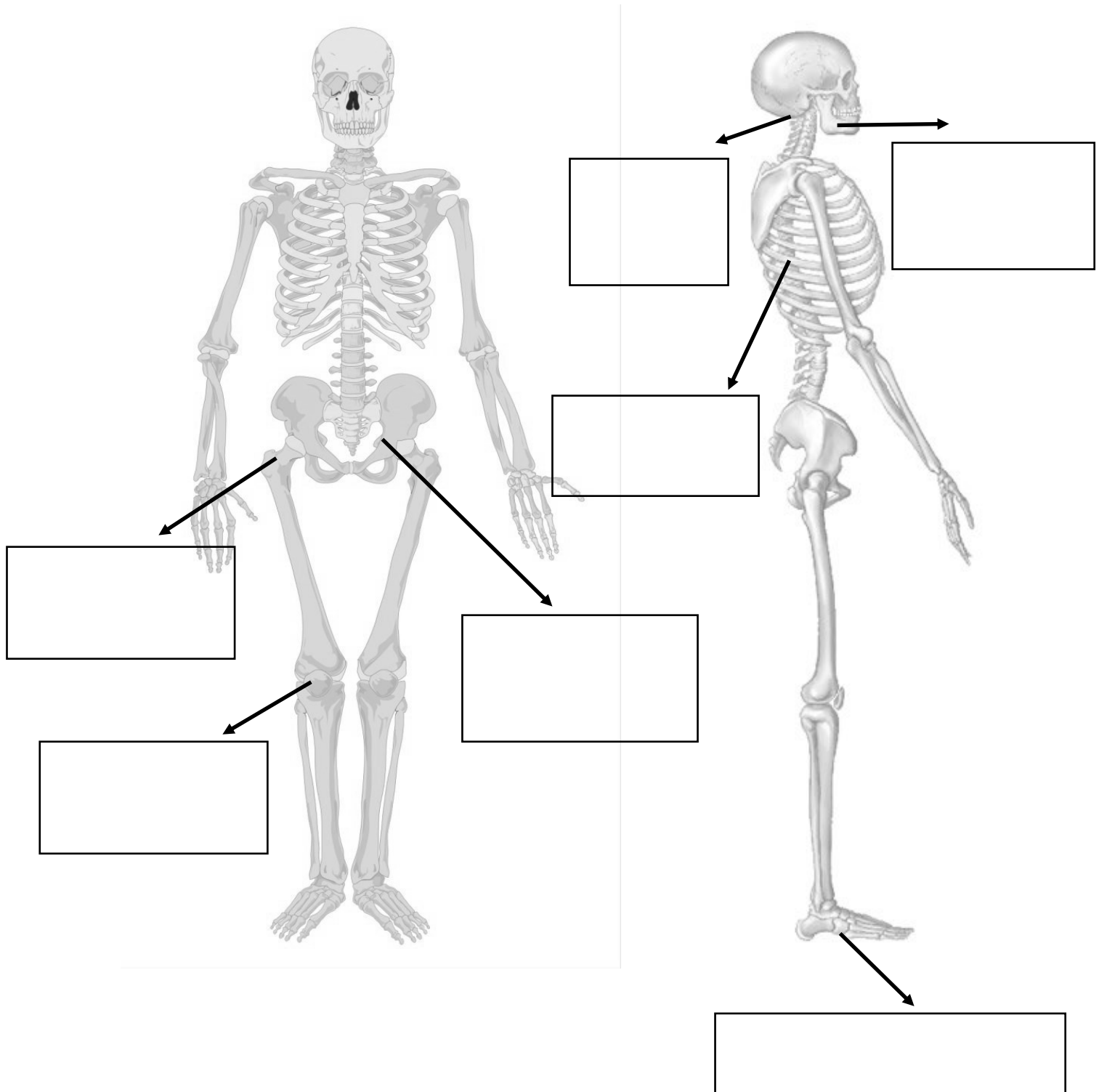


Past and Present Primates

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7. Great Ape Locomotion. Significant changes have had to occur for humans to obtain an erect posture and walk on two legs (bipedal).

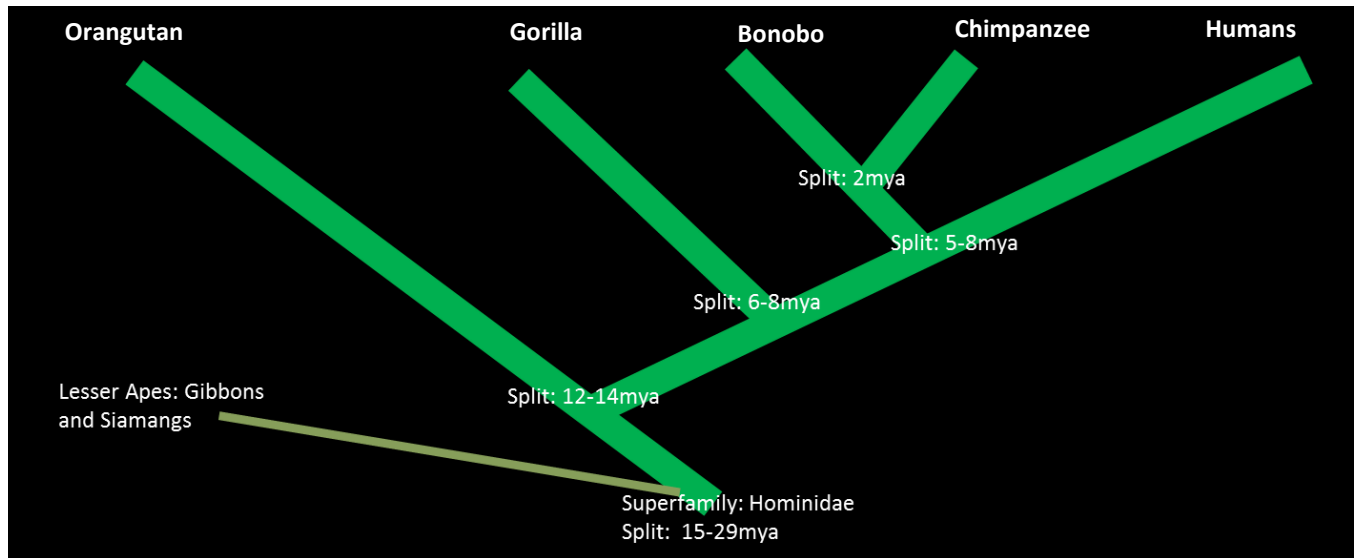
On the skeleton below, label the skeletal changes that have occurred in humans.



Past and Present Primates

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8. Phylogenetic Trees are used to show evolutionary relationships between species based upon similarities and differences in physical or genetic characteristics. They illustrate which species are related to a common ancestor and an estimated time for when this occurred and when divisions occurred. Fossils and Biotechnology including DNA sequencing can provide information to build phylogenetic trees and enhance our understanding of human evolution.



From the tree above, when is it estimated that chimpanzees and humans last shared a common ancestor?

There is a well supported theory that the split between early humans from chimpanzees and bonobos was the result of significant changes in the environment. Describe these changes and how this affected early humans.

The Hominins—Early Humans

Describe the key trends found in the fossils of early humans that distinguish them from other great apes.

1. _____
2. _____
3. _____
4. _____
5. _____



Past and Present Primates

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9. List the significant features found in key species of the early hominin (human) fossil record.

Australopithecus afarensis
Existed between 4 and 3mya

- _____
- _____
- _____
- _____

Australopithecus africanus
3.2—2mya

- _____
- _____
- _____
- _____

Paranthropus robustus
2.3— 2.7mya

- _____
- _____
- _____
- _____

Homo Habilis
2.4— 1.5mya

- _____
- _____
- _____
- _____

Homo erectus
1.6—100,000ya

- _____
- _____
- _____
- _____

Homo Neanderthalensis
300,000—28,000ya

- _____
- _____
- _____
- _____

Homo Sapien
160,000ya—today

- _____
- _____
- _____
- _____

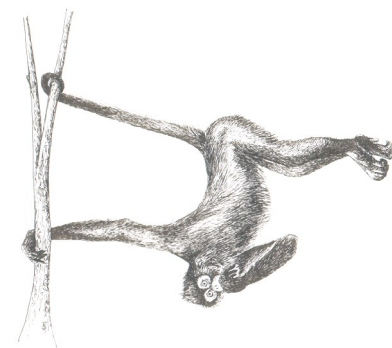


Past and Present Primates

Human Biological Science: Unit 4 (ATAR)

Out and About in the Zoo: Activity A - Features of Primates at Perth Zoo

	Suborder: Strepsirrhini	Suborder: Platyrrhini (New World Monkeys— Tamarins and Marmosets)	Superfamily: Cercopithecoidea (Old World Monkeys— Baboons)	Family: Hylobatidae (Lesser Ape)	Family: Hominidae (Great Apes— Orangutans)	Genus: Homo (Humans)
Primate observed						
Tail present						
Tail prehensile						
Opposable thumb						
Opposable toe						
Sexual dimorphism						
Arboreal						
Terrestrial						



Using the table above, can you describe the difference between:

- 1) Strepsirrhini and Haplorrhini
- 2) Old World and New World Monkeys
- 3) Lesser and Great Apes
- 5) Humans from Monkeys



Out and About—Exploration out in the Zoo

Activity Sheet B: Orangutan Social Behaviour and Sexual Dimorphism

Sexual dimorphism is quite pronounced amongst certain primate groups. These differences between the sexes are thought to have adaptive advantages in terms of survival, communication and reproduction.

Individual	Description	Explanation
Adult ♂		
Adult ♀		
Newborn ♂ or ♀		

Does sexual dimorphism exist in humans? Explain your reasoning.

Most great apes live in mixed social groups of males, females and young. Observe and describe the social grouping of the Orangutans at Perth Zoo. What does this suggest to you about how they live in the wild?



Out and About—Exploration out in the Zoo

Activity Sheet C: Non-Human Great Ape Locomotion

Visit the Orangutan exhibit. Observe and record the locomotion you observe being displayed by the Orangutans.



Based on the **skeletal structure** of the Orangutan, **relate** how it **affects** their **locomotion** and **appearance**.

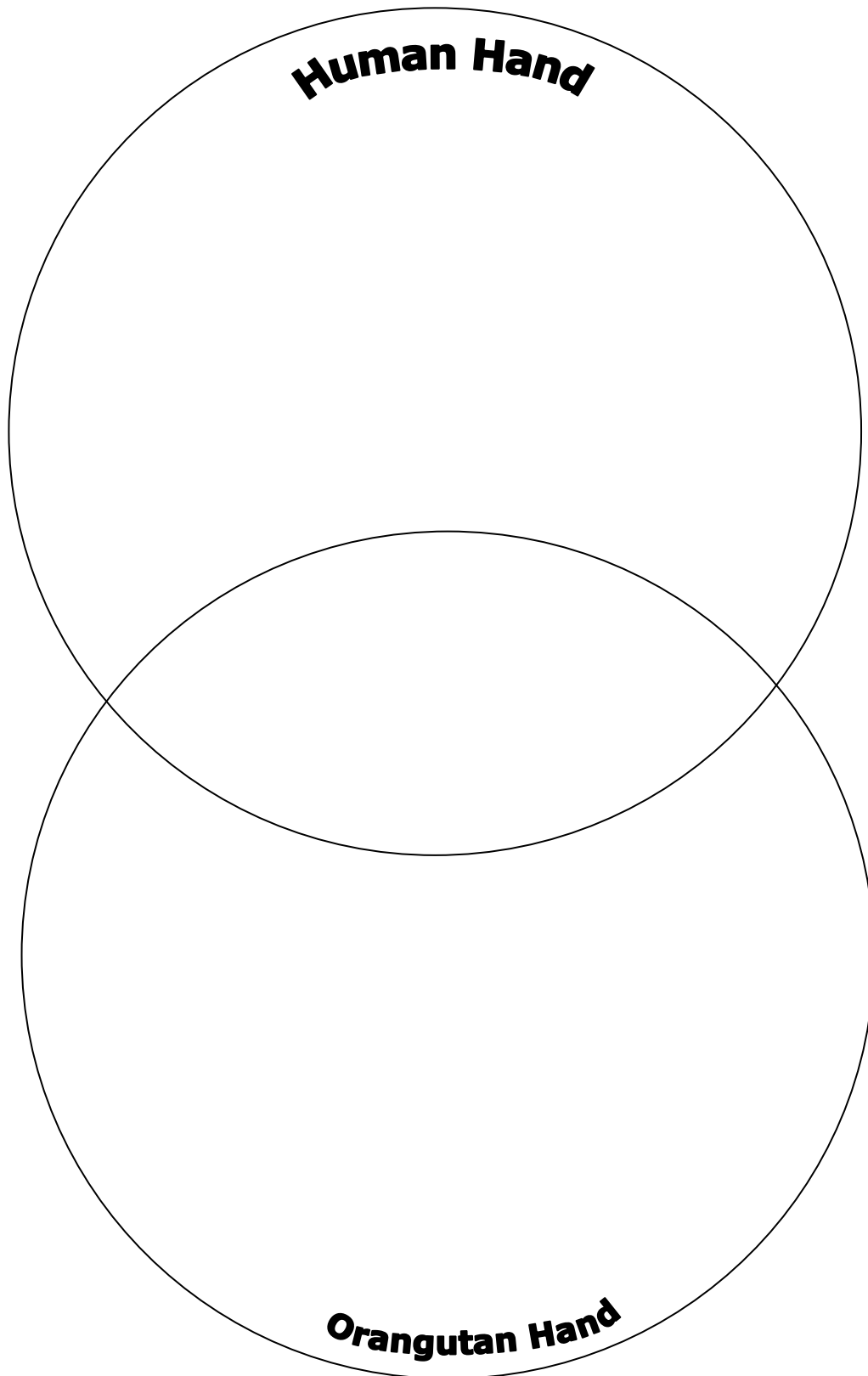


Activity Sheet D - Looking at Primate Hands

Trace an outline of your hand over the picture of an Orangutan hand print (life-size). Note down differences and similarities between both primate hands and try to consider some of the reasons behind these differences. Use the Venn diagram on the next page to assist with your comparisons. Visit the Orangutan exhibit to observe how they use their hands. (Hint: Consider overall size of hand, opposability of thumb, size of digits, locomotion, etc.)



Activity Sheet D - Looking at Primate Hands cont.



Past and Present Primates

Human Biological Science: Unit 4 (ATAR)

Activity Sheet E - Mimicking a Sumatran Rainforest

Perth Zoo's Sumatran Orangutan exhibit has been designed to mimic several aspects of a real rainforest. Note down how each aspect of living in a rainforest is being replicated in this exhibit.

Adjustable ropes:

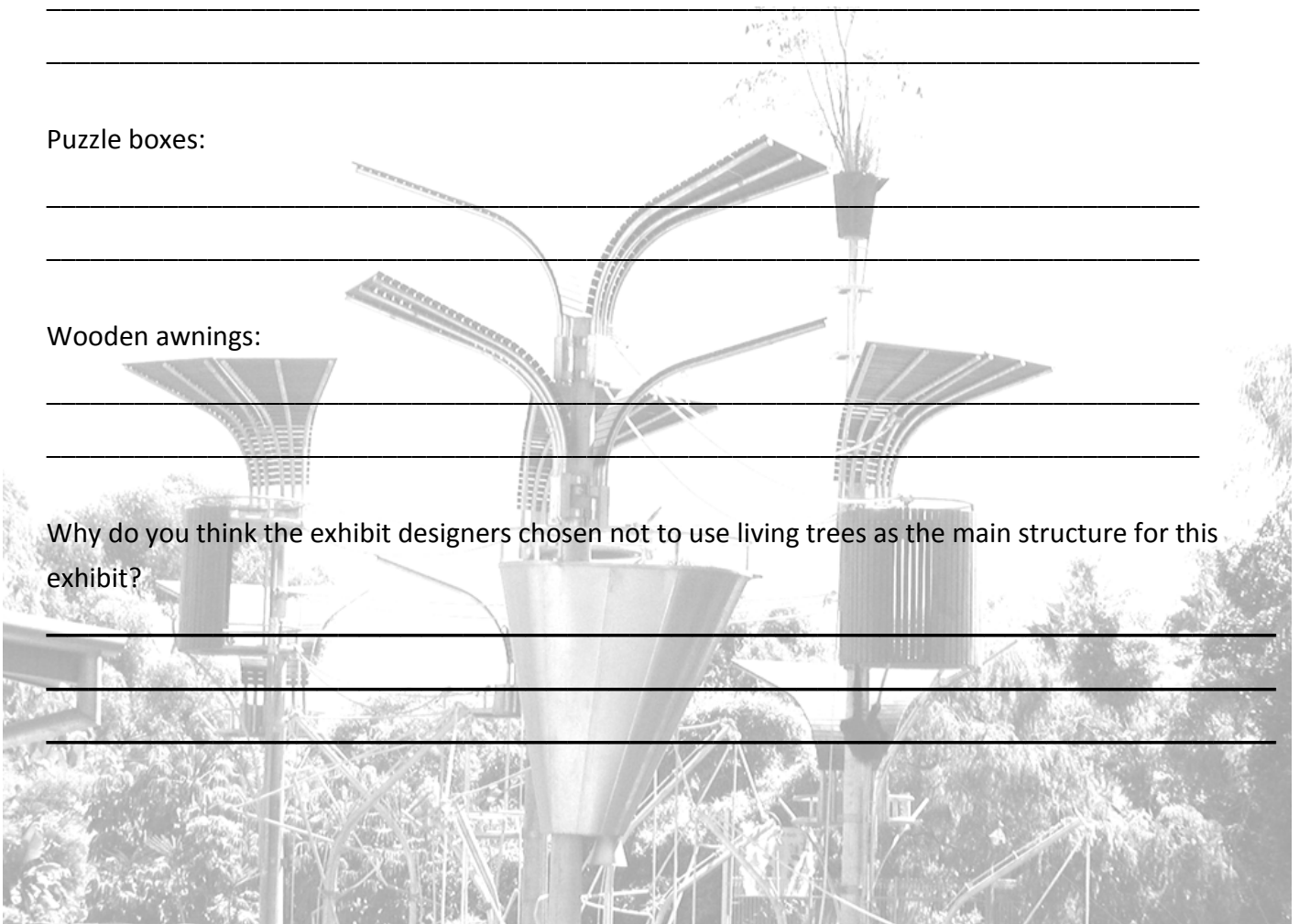
Metal climbing frames:

Platforms:

Puzzle boxes:

Wooden awnings:

Why do you think the exhibit designers chosen not to use living trees as the main structure for this exhibit?



APPENDIX A

Primate Location Sheet

PRIMATE GROUP	SPECIES	LOCATION
Strepsirrhini	Ring-tailed Lemur	Lesser Primates
	Ring-tailed Lemur	Main Lake
	Black and White Ruffed Lemur	Lesser Primates
New World Monkeys	Pygmy Marmoset	Lesser Primates
	Emperor Tamarin	Lesser Primates
	Cotton-top Tamarin	Lesser Primates
	Black-capped Capuchin	Lesser Primates
	Bolivian Squirrel Monkey	Lesser Primates
Old World Monkeys	Hamadryas Baboon	African Savannah
Lesser Ape	White-Cheeked Gibbon	Asian Rainforest
Great Apes	Orangutan	Asian Rainforest



APPENDIX B

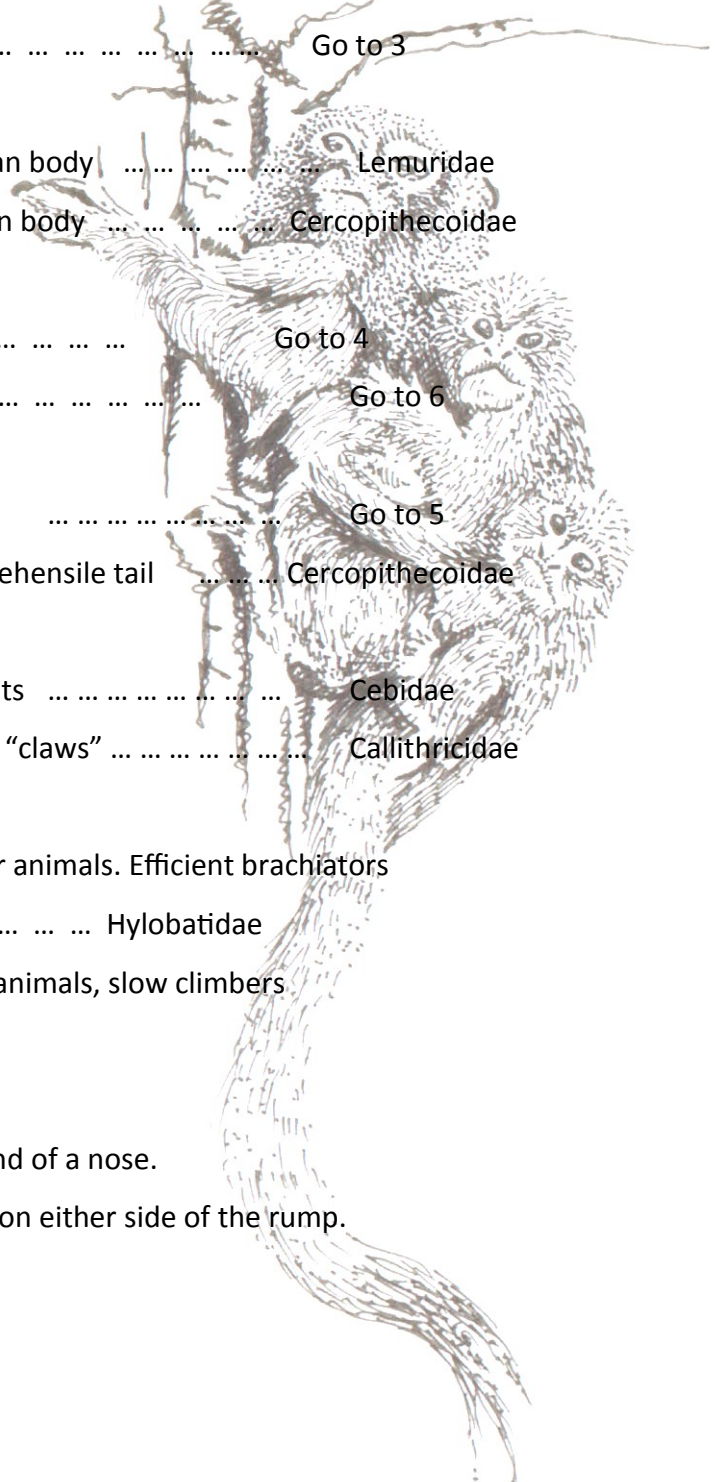
Primates of Perth Zoo

Use the Dichotomous Key below to help you identify the different primate families at Perth Zoo.

1. a. Protruding snout Go to 2
b. Flat face; full frontal vision Go to 3
2. a. Wet rhinarium¹. Tail longer than body Lemuridae
b. Dry rhinarium. Tail shorter than body Cercopithecoidae
3. a. Visible tail Go to 4
b. No visible tail Go to 6
4. a. No Ischial callosities². Long tail Go to 5
b. Ischial callosities. Long, non-prehensile tail Cercopithecoidae
5. a. Tail prehensile. Nails on all digits Cebidae
b. Tail non-prehensile. Digits with "claws" Callithricidae
6. a. Arms longer than body. Slender animals. Efficient brachiators
... .. Hylobatidae
b. Arms longer than body. Large animals, slow climbers
... .. Pongidae

¹Rhinarium - a hairless pad of skin at the end of a nose.

²Ischial callosities - hairless, callused areas on either side of the rump.



APPENDIX C

Learn the Lingo

Several terms and phrases are commonly used when discussing primates. Find out the meaning of the following terms and phrases to expand your biological vocabulary.

- Adaptation
- Arboreal
- Bipedal
- Brachiation
- Cerebral cortex
- Diurnal
- Home range
- Ischial callosities
- Nocturnal
- Oestrus
- Olfactory system
- Opposable digits
- Pentadactyl
- Power grip
- Precision grip
- Prehensile
- Quadrupedal
- Sexual dimorphism
- Submission
- Terrestrial
- Theory of evolution
- Hominins

