



Ethics, Zoos and YOU!

Teacher Workbook

VCE Psychology

Units 1 - 4 | Key science skills

A scientific investigation into captive animal welfare, including ethics and research methods



The Ethics, Zoos and You program is an opportunity for students to understand science as a human endeavour, by gaining insight into how psychology skills and knowledge can be used in animal welfare and wildlife conservation.

The program consists of two Zoo Educator-led workshops. A Zoo Educator will lead the workshops at two locations – Digest Ed and the Orangutan Sanctuary. A map of these locations can be found in the Appendix. At the time of booking, teachers must select the focus of workshop two: **behaviour change or research methods**.

A big question will frame the students day, **‘How are psychology skills and knowledge used in wildlife conservation?’** To help find an answer to this question, students will have the opportunity to:

- Develop an understanding of ethical principles and their importance, through facilitated discussions and experience as a participant in psychological research
- Apply understanding using the model of Zoo’s Victoria’s Animal Ethics Committee and a current ethical dilemma
- Workshop option 1: Undertake a scientific investigation into captive animal welfare at Melbourne Zoo which includes formulating a hypothesis, collecting and recording qualitative and quantitative data in an observational study, and analyzing and evaluating the data with the support of a Zoo expert
- Workshop option 2: Students explore key knowledge in Unit two; how Zoos Victoria applies the tri-component model to influence and shape the behaviour of our visitors through the analysis of a community conservation project, *Don’t Palm Us Off*.

Curriculum Links – see Appendix 1 for detailed links to VCAA outcomes

- VCE Psychology
- Units 1-4: Key science skills: the role of ethics committees and ethical principles
- Units 1-4: Key science skills: conduct a scientific investigation including data collection
- Unit 2: Area of study 2: How are people influenced to behave in particular ways?

Student Booklet

The student booklet is the same format as the teacher booklet and includes preparation material, guiding questions and data collection sheets to be used on the day. The teacher booklet includes question answers, an introduction page, and an appendix with additional teacher resources.

Post-visit

Data collected onsite for option 1 can be used by students to complete a scientific poster relating to animal behaviour and to communicate authentic and assessable scientific ideas. VCAA mapping, a blank scientific poster and information on wild orangutan activity budgets are in the teacher appendix.

Alternatively, if teachers wish to extend students doing workshop option 2, analysis of behaviour change and *Don’t Palm Us Off*; we encourage the development of a School Assessed Coursework that supports the tri-component model. Students may be asked to develop a school-based community project to encourage school-wide behaviour change or another of their choosing. More information about this project, and other projects, can be found at;

<https://www.zoo.org.au/education/community-projects>

Prepare for your animal investigation at the Zoo

Pre-excursion activity

During your excursion at the Zoo, you will conduct an observational data collection with the guidance of a Zoo educator. Prior to arriving at the Zoo, you need to develop an investigation aim and hypotheses, research the animal and note down any relevant information, and ensure you understand what time budgets are and their use in a Zoo.

Time budget protocol

Time budgets are an overview of how and where animals spend their time, as well as how rare or common certain behaviours are for individuals.

From a welfare assessment perspective, any deviations in normal time budget for an individual can be used to flag potential concerns. In addition, it is important for zoos to be providing behavioural opportunities for animals in their care that appropriately reflect natural behavioural repertoires. Thus, they provide a lot of valuable information for advancing welfare standards through behavioural management.

Below are the first steps to developing and conducting a basic research project. This is designed to be a generic research protocol for any studies that aim to collate information on how an animal spends its time. It is designed to provide a standard framework for studies that can be tweaked to suit the particular species of interest.

- 1. Ask a question** – this is the first step in identifying what sort of research you want to conduct and drives the formulation of your hypotheses, study design and analysis. In this instance, the question has been identified for you:
“How does the activity budget for an orangutan in captivity, differ from the wild?”
Other questions the Zoo has investigated include: Is animal x in a state of positive welfare? What does animal x do? Does enrichment x have an impact on animal x? All of these questions rely, at least in part, on accurate time budget data.
- 2. Formulate your hypothesis** – a clear hypothesis will invite a direct test and help you design your study. For example ‘enrichment x will increase animal x’s time spent foraging’. A hypothesis can also incite a direct test that can be observed in natural variation also. For example ‘Foraging behaviour in animal x increases when temperatures are higher’. Thinking about hypotheses and predictions will help with the next few steps to design the methods and select the correct measures. **Use the activity budgets of wild orangutans to guide you (Appendix 3)**. You might seek guidance from your teacher here.
- 3. Take some observations** – During your excursion at the Zoo, you will test your hypothesis and collect data for your animal species.



The Melbourne Zoo Learning Experiences Team, respectfully acknowledges the Wurundjeri People, the Traditional Custodians of the land on which we work, live and learn. We recognise their continuing connection to land, water and wildlife and pay respect to Elders past, present and emerging.

Ethics and animal welfare

On site educator-led workshop

BIG QUESTION: How are psychology skills and knowledge used in wildlife conservation?

“As a zoo-based conservation organisation, Zoos Victoria believes that just as the conservation and welfare of species in the wild is paramount, so too is the welfare of the animals in our collection.”¹

How does psychology inform Zoos Victoria’s work with captive animals?

We have an ethical obligation to ensure all animals in our zoos receive the best care and remain in neutral or positive welfare states. With your understanding of psychology, the mind and behaviour, consider how this knowledge might inform Zoo practice of captive animals?

What does Zoos Victoria need to consider, to ensure the welfare of our animals?

“Psychology can inform us here at Zoos Victoria of the environmental, behavioural and psychological needs of a species. Psychology can also help us keep our animals free from fear and distress. For example: designing an enclosure to allow individual to choose how close visitors can come to them or even whether visitors can see them at all.

It can help us consider the following: how to promote species appropriate behaviours and activity levels; how to minimize aberrant (abnormal) behaviours; and how to provide the best enrichment and conditioning programs.”²

Ethical guidelines

Unit 1-4 Key science skill; *Comply with safety and ethical guidelines: understand the role of ethics committees in approving research and apply ethical principles.*

Zoos Victoria’s Animal Welfare Code is intended to ensure that at all times and in all instances, the needs, interests and welfare of our animals is our primary consideration.

The Zoo investigates animal welfare during animal encounters and interactions with visitors. **If this was an experiment and you were the participants, consider the role of the experimenter when you meet an animal. What ethical considerations would need to be discussed with the participants?** *Code of Ethics: Ethical Principles which ensure the respect and protection of participants*

<i>Protection and security of participants’ information – personal information is safe from misuse, interference, loss, unauthorised access, modification or disclosure.</i>	<i>5. Informed consent procedures – voluntary choice must be based on sufficient information and adequate understanding of research and consequences of participation.</i>
<i>2. Confidentiality - not to use or disclose private information for any purpose other than for which it was given</i>	<i>6. Use of deception – participants are deliberately misled or not fully informed. Only acceptable if benefits justify use and with debrief.</i>
<i>3. Voluntary participation – the researcher must ensure participants voluntary consent.</i>	<i>7. Debriefing – clarifying each participant’s understanding of the nature of the research after it has concluded.</i>
<i>4. Withdrawal rights – unconditional right to withdraw at any time without giving a reason.</i>	

Role of ethics committees

“The National Statement requires that all research that carries more than a low level of risk to human participants must first be reviewed and approved by an ethics committee. This type of committee is formally called a *Human Research Ethics Committee (HREC)*.”³

¹ Zoos Victoria. May, 2009. Animal Welfare Code. [<http://www.zoo.org.au/sites/default/files/ZV-animal-welfare-code.pdf>]

² Zoos Victoria. May, 2009. Animal Welfare Code. [<http://www.zoo.org.au/sites/default/files/ZV-animal-welfare-code.pdf>]

³ Grivas, J. 2016. PSYCHOLOGY VCE UNITS 1 AND 2, seventh edition. John Wiley & Sons, Australia. 70 pp.

In the process of saving endangered species and providing the best welfare for our animals, Zoos Victoria comes across many complex conservation dilemmas which need to go through a committee called an *Animal Ethics Committee (AEC)*.

What is an ethics committee? What are some of its roles and responsibilities?

An ethics committee has a minimum number of researchers and non-researcher participants. Its purpose is to assess research proposals for approval purposes, and then monitor the research to ensure all relevant ethical standards are adopted and followed.

Roles include: assessing research proposals using the National statement; deciding whether the researcher(s) are adequately experienced and qualified; monitor approved research; handling complaints; ensuring accountability of researchers.⁴

Zoos Victoria’s Animals Ethics Committee (AEC) is made up of a range of representatives as required by the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes. Zoos Victoria’s AEC meet on a bi-monthly basis to assess and review the welfare and ethical considerations of research proposals.

Reference: <http://www.zoo.org.au/fighting-extinction/research>

An AEC always consists of the four members listed below. Each member brings the following experience and expertise to the AEC.

Scientific researcher/expert	They have appropriate recent research or teaching experience. This experience should be relevant to the species used and the activities conducted in the institution.
Veterinarian	They have a degree in veterinary science with experience relevant to the species used and activities conducted in the institution.
Animal welfare representative	They are a person who is ideally an active member of an animal welfare organisation, with a commitment to furthering the welfare of animals.
Lay person	An independent person who does not currently, and has not previously conducted scientific or teaching activities using animals, and who is not an employee of the institution.

Reference: <http://www.animaethics.org.au/policies-and-guidelines/operation/criteria-for-assessment>

Case Study: Cross Fostering of Helmeted Honeyeater Eggs

Overview



⁴ Grivas, J. 2016. PSYCHOLOGY VCE UNITS 1 AND 2, seventh edition. John Wiley & Sons, Australia. 70 pp.

What ethical questions and concerns may arise from this case study?

In groups, discuss each viewpoint and note down any questions, concerns, recommendations or conditions from the perspective of each AEC member.

<p>Scientific researcher/expert</p>	<ul style="list-style-type: none"> • <i>What is the conservation status of each species involved?</i> • <i>(Yellow Tufted Honeyeaters are rated Least Concern (IUCN Red List of Threatened Species 2012). Currently they do not require any conservation support. Helmeted Honeyeaters are critically endangered and are extremely unlikely to recover without human intervention and help.)</i> • <i>What are similarities and differences between the two species? In particular, do both species feed their young the same diet, and will there be any behaviours that are unique to Tufted Honeyeaters that the fostered chicks may learn?</i> • <i>Are there any other species that could raise the eggs instead?</i> 	
<p>Veterinarian</p>	<ul style="list-style-type: none"> • <i>Are there any pathogens that could be transmitted from the Tufted Honeyeaters to the Helmeted Honeyeaters?</i> • <i>Are there carry-over effects of this practice in adult birds? E.g. mate selection, parent-offspring communication and imprinting?</i> 	
<p>Animal welfare representative</p>	<ul style="list-style-type: none"> • <i>Where will the Tufted Honeyeaters be sourced from?</i> • <i>Where will the birds be kept?</i> • <i>Will they be released back into the wild afterwards if they are wild caught?</i> • <i>Is there a backup plan if the Tufted Honeyeaters reject the new eggs?</i> • <i>Do the Helmeted Honeyeaters who have eggs removed show any signs of distress?</i> • <i>Can the cross-fostered chicks be released into the wild once they are mature?</i> 	
<p>Lay person</p>	<ul style="list-style-type: none"> • <i>How might the general public feel about cross fostering the Honeyeaters?</i> • <i>What may influence their opinions? (values/morals/life experiences)</i> • <i>Why can't the removed eggs be raised by zoo keepers?</i> • <i>Does it actually make a noticeable difference to the size of the Helmeted Honeyeater population?</i> 	

Scientific Research Investigation

On site educator-led workshop

“The physical and psychological wellbeing of captive animals depends of the suitability of the physical and social environment at the zoo, including the exhibit space, animal group size and composition, and the impact of visitors.

It will also depend on the veterinary care and nutrition provided and on husbandry routines and procedures, including the use of enrichment and training. **Research** enables us to measure the effectiveness of our animal management programs and improve the wellbeing of our animals”.⁵

Research Title: *How does the activity of an orangutan in captivity, differ from one in the wild?*

Prior Knowledge/Research

- Dr Sally Sherwin’s Research on Orangutan activity levels in the wild (teacher notes)
- Summarise relevant Orangutan information (this may include social status and group behaviour, climate/habitat in the wild, activity levels in the wild)
- <https://www.zoo.org.au/melbourne/animals/sumatran-orang-utan>
- <http://pin.primate.wisc.edu/factsheets/entry/orangutan>
- Information on Melbourne Zoo’s Orangutans and the enrichment they receive will be discussed during the first Educator-led workshop on the excursion.

Aim: Students will use research methods and behavioural observation techniques to capture data and conduct fieldwork which addresses the scientific investigation question and their hypothesis. This research is representative of the type of research used to inform Zoos Victoria’s work with captive animals.

Hypothesis: *It is hypothesized that orangutans in captivity will/will not have an increase in activity levels when compared with orangutans in the wild.*

Method

Participants: Orangutans

Materials: Data collection sheets in student booklets, pen, stop watch

Procedure:

1. Go with the zoo educator to the orangutan sanctuary
2. Select an orangutan to observe
3. Using the qualitative data collection sheet observe and record animal behaviour with assistance from the zoo educator.
4. Familiarise yourself with the behaviour key on the quantitative data collection sheet
5. Using the quantitative data collection sheet observe and record animal behaviour with assistance from the zoo educator.
6. Identify and analyse any variables, challenges and observations.
7. Report the research and findings, interpret results and make recommendations for zoo keepers or further research.

Identify potential variables on the day:

⁵Zoos Victoria. 2018. Research Theme: Animal health and well-being. [<http://www.zoo.org.au/fighting-extinction/research/research-theme-animal-health-and-well-being-->]

Behaviour Key	
Active behaviours	Code
Locomotion (climbing/walking)	L
Forage/enrichment	E
Grooming (Self/ Being Groomed)	G
Play	P
Resting behaviours	Code
Resting (Sitting/laying)	Re
Contact (Holding Another/being held)	Con

If your animal cannot be sighted for more than three intervals you will need to select another individual to observe and record.

Before starting, record the details for your individual animal and the research conditions of the day.

Data Collection - Quantitative Research

What is 'Quantitative' data and when would you use this method of data collection?

*"Quantitative data is numerical information on the 'quantity' or amount of what is being studied; that is, how much of something there is. The use of numerical data makes it easier to summarise and interpret information collected through research. This is why quantitative data is often preferred to qualitative data, although this does not mean that qualitative data is less important or less useful than quantitative data."*⁷

Working in pairs, one student observes an animal every **10 seconds** and identifies its behavior using the Behaviour Key. The other student uses a timer or counts the 10 second intervals and records their partners' observations in the table.

Species:	Name of observer/s:	Day/Date:
Time:	Sex: M / F	Age: Juvenile /Adult
Weather: Sunny/Overcast/Raining Hot/Warm/Cold Still/Windy		
Individual observed: (Distinguishing marks, size, colour, features, scars, and tattoo)		
<i>1.</i>	<i>11.</i>	<i>21.</i>
<i>2.</i>	<i>12.</i>	<i>22.</i>
<i>3.</i>	<i>13.</i>	<i>23.</i>
<i>4.</i>	<i>14.</i>	<i>24.</i>
<i>5.</i>	<i>15.</i>	<i>25.</i>
<i>6.</i>	<i>16.</i>	<i>26.</i>
<i>7.</i>	<i>17.</i>	<i>27.</i>
<i>8.</i>	<i>18.</i>	<i>28.</i>
<i>9.</i>	<i>19.</i>	<i>29.</i>
<i>10.</i>	<i>20.</i>	<i>30.</i>

Post-excursion

Back at school your teacher will assist you in interpreting the data collections you have done. You may be asked to use them to complete a SAC task such as an analysis of data.

Discussion

- a. Describe the data you have collected and note any trends or outliers you have observed.
- b. Note any challenges that arose during data collection – how could you overcome these?
- c. What are some factors that might have affected the data you obtained today?
- d. What is the next step or direction for further research or recommendations for the keepers?

*Possible answers⁷

- a. Possible trends observed may include:
 - Activity levels are highest in the mornings and decrease in the afternoon
 - Activity levels increase when there is a change in environment: scatter feeds, enrichment items given, orangutans moved from one exhibit to the next
 - Activity levels decrease when all enrichment has been explored
 - Activity levels decrease when weather is cold (orangutans huddle in blankets)
 - b. Challenges students may observe include:
 - Orangutans go out of sight
 - Zoo visitors get in the way of the observation
 - Behaviours such as aggression are observed but are not part of the study
 - Students observe a significant difference in the activity budget of individual orangutans (this may be due to age, sex, personality etc.)
 - c. Factors which might affect data:
 - Extraneous variables such as weather conditions, noise/activity level of visitors in the Orangutan Sanctuary
 - Time of day: Activity levels tend to be higher in the mornings
 - Differences in individual orangutans (age, sex, personality)
 - d. Recommendations for keepers or further research may include:
 - Implement rest time 1-2pm
 - Increase random enrichment and training in low activity times (3-4pm)
 - Utilise timed feeders (students might specify times)
 - Increase complexity and duration of enrichment
 - Utilise greens to increase foraging during the day
 - Daily destructible items for manipulation and nest building in addition to enrichment.
 - Provide social opportunities for individual pairings
 - Implement environmental flexibility through choice sessions on a fixed schedule i.e. every Monday at 2pm Santan gets to choose during one session which exhibit he would like to go into. Use clear visual and auditory signals to announce session.
- *Carry out study on each of the above interventions*
 - *Conduct 12 monthly Activity Budgets.*

Conclusion: Relate back to original research question and compare your results with the prior knowledge you have collected using Dr Sally Sherwin's Activity Budget diagrams.

- *Conclusions may vary but are likely to conclude that activity levels are lower in captivity than in the wild.*

⁷ "Orangutan Activity Budgets", observational study at Melbourne Zoo, 2014-2018.

Appendix 1 - VCAA outcome mapping

Activity	VCAA Outcomes	Learning intentions
<p>Educator-led Workshop 1 <i>45 minutes</i></p> <p>A Zoo educator will introduce students to ethics at the Zoo and the ways we use psychology skills and knowledge in animal welfare and wildlife conservation.</p>	<p>VCE Psychology Units 1 - 4: Key Science skills</p> <p>Comply with safety and ethical guidelines: understand role of ethics committees and application of ethical principles.</p>	<ul style="list-style-type: none"> • To gain a deeper understanding of how ethical principles in psychology are applied in animal research • To understand the role of the ethics committee at the Melbourne Zoo and how they create ethical animal research
<p>Educator-led Workshop 2 <i>45 minutes</i></p> <p>A Zoo educator will facilitate a workshop at the orangutan sanctuary.</p> <p>At the time of booking, teachers must select the focus of the session: behaviour change or research methods.</p>	<p>VCE Psychology Units 1 - 4: Key Science skills</p> <p>Plan scientific investigations: determine aims, formulate hypotheses, identify variables.</p> <p>Conduct investigations to collect and record data: observational study of a sample population with qualitative and quantitative data collection, independent and collaborative work, access to secondary data</p> <p>Analyse and evaluate data: organise, present and interpret data, evaluate investigative procedure and possible sources of bias, make inferences and suggestions regarding the population and data</p> <p>Draw evidence based conclusions: make conclusions and recommendations, consider limitations and implications</p> <p>Communicate scientific ideas: discuss relevant psychological information, using correct terminology, present information as a scientific report or poster.</p>	<ul style="list-style-type: none"> • For students to apply the key skills required for scientific investigations in an investigation into the activity levels of orangutans at the Melbourne Zoo • For students to be able to differentiate between qualitative data and quantitative data collection • To be able to identify possible extraneous variables • To be able to draw conclusions based on the data collected

Appendix 2 – Scientific poster template

TITLE (QUESTION UNDER INVESTIGATION)

INTRODUCTION (BACKGROUND TO THE RESEARCH; SUMMARISE THEORY AND RESULTS OF RELEVANT RESEARCH; EXPLAIN RATIONALE FOR CONDUCTING RESEARCH)

INTRODUCTION (continued)

Aim:

Hypothesis:

DV:

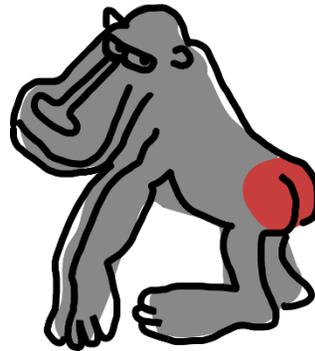
IV:

Method

Participants:

Materials:

Procedure:



Ethical Considerations:

Results (a clear and accurate summary of main results)

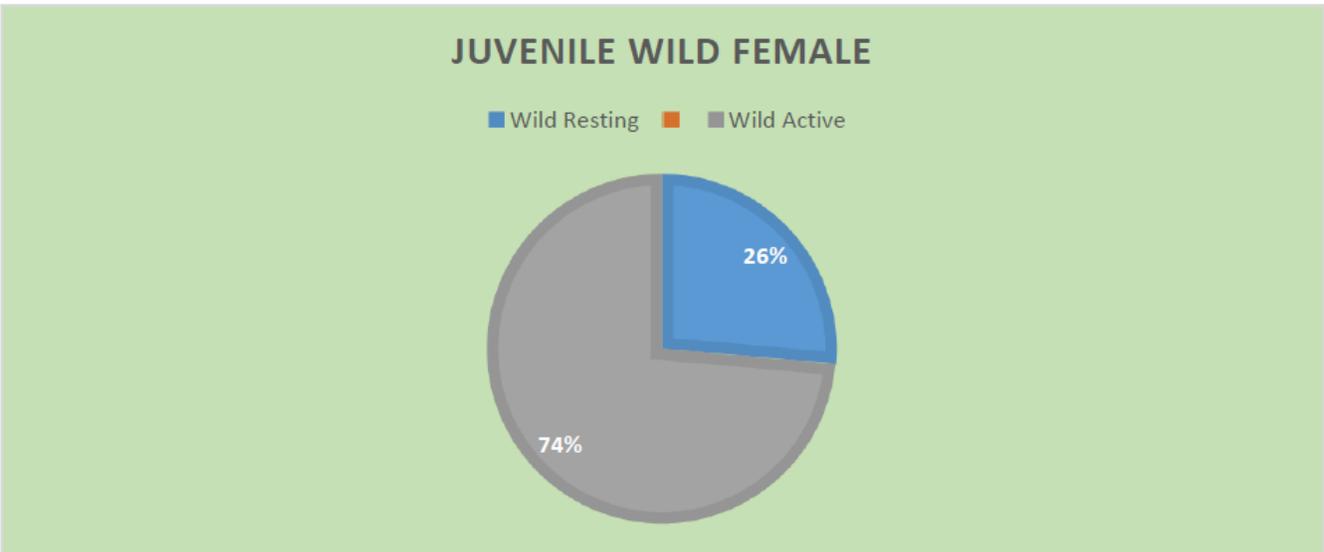
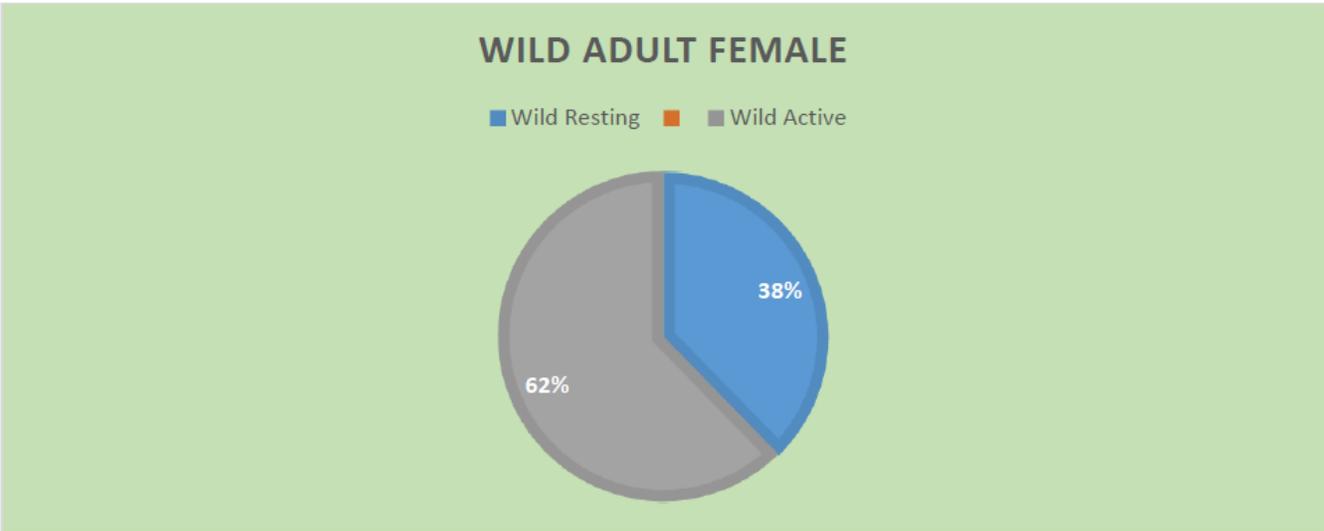
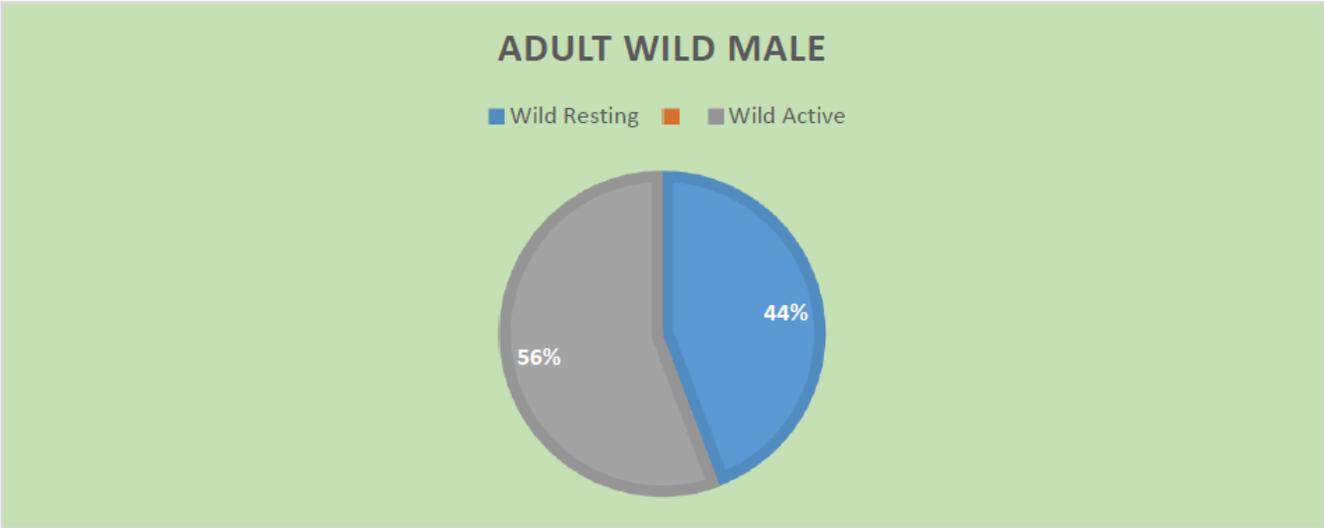
Discussion: (Begin with a clear statement about whether the hypothesis was supported on the basis of the results obtained. Examine, explain and interpret the results. Discuss limitations and suggest improvements).

Discussion (continued):

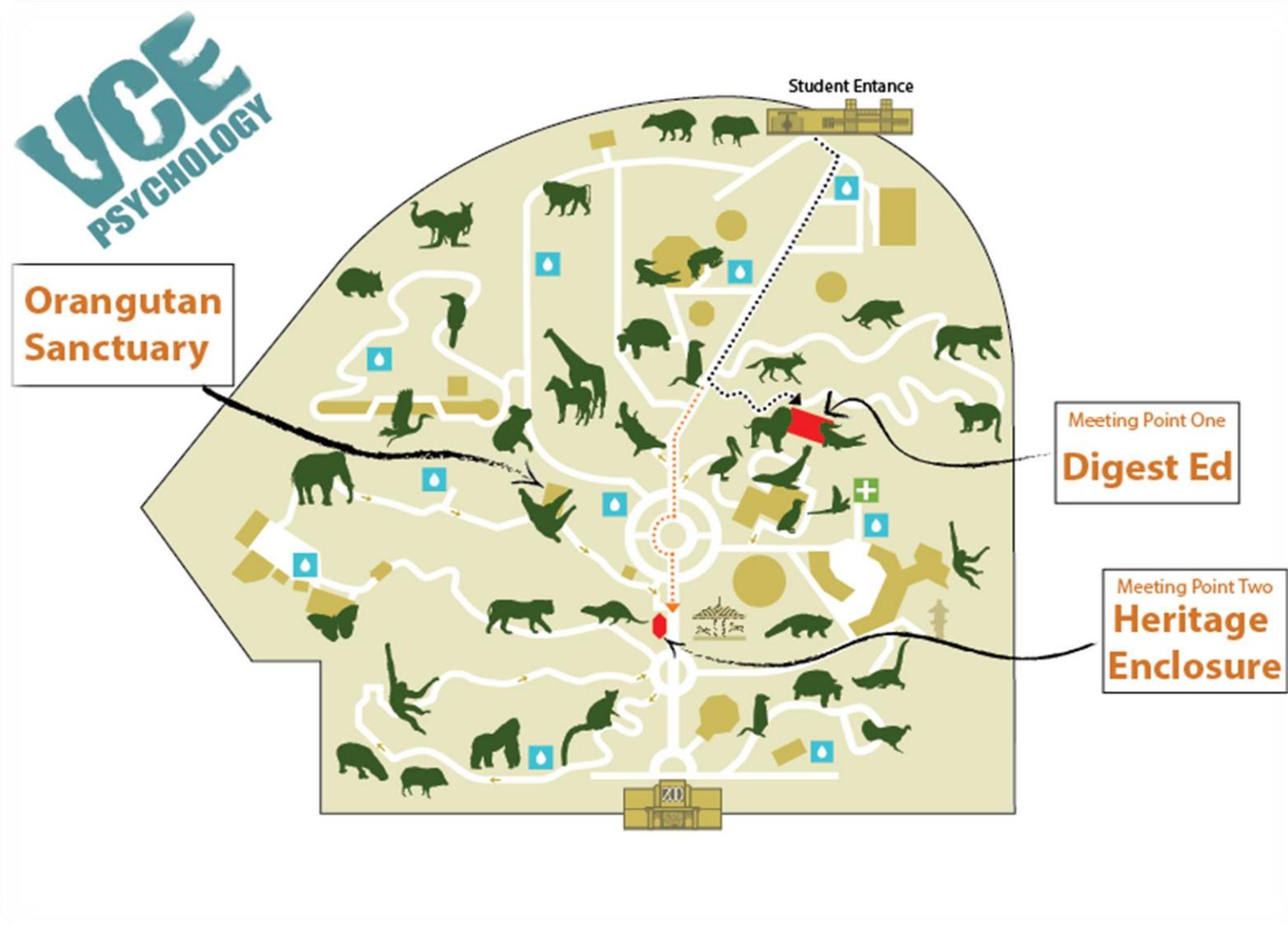
- **Conclusion (provides a response to the research question) and Generalisation (practical application of findings to real world):**

References (a list of all sources cited in report)

Appendix 3 - Wild Orangutan Activity Budgets



VCE Psychology Map



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