Animal Adaptations and Features

Welcome to our Animal Classification and Adaptations program. Generating student excitement when prepapring them for a visit is crucial, we have created a short video to help give your students a basic understanding of classification and adaptations and to build excitement about their visit.

Here is some additional information to get the best out of your day at Melbourne Zoo. There are a number of pre-visit activities to prepare your students before coming to the Zoo. Before embarking on your adventure to the Zoo for your Animal Classification and Adaptations program ***please ensure that the student learning booklet and teacher handbook have been printed and handed out.***

On arrival to the Rail Gate (schools' entrance for Melbourne Zoo) the organising teacher will be required to go to the ticketing window to fill out and sign paper work. Depending on your session time with the Zoo educators you and your students will have time to commence the student learning booklet. The tasks will challenge the students to apply their learning to the work requirements contained in their student learning booklet and answer the big question for the day:

Contents

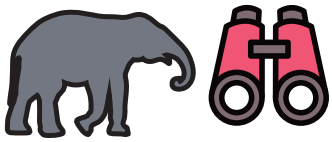
The Melbourne Zoo Learning Experiences Team, respectfully acknowledges the Wunrundjeri People, the Traditional Custodians of the land on which we work, live and learn. We recognise their continuing connections to land, water and wildlife and pay respect to Elders past, present and emerging.

MELBOURNE ZOO

State Government Victoria Department of Education and Early Childhood Development

ceocv catholic education commission of victoria ltd ACN 119 459 853

What to Expect On the Day

Activity	Time	Location
Educator Facilitated Workshop A Zoo Educator will facilitate students learning about the definitions for classification and adaptations and their importance for animal conservation. During the workshop student will have access to animal bio-facts including a number of skulls as well as facilitated observations sessions of the animals in our care.	Workshops commence at: 10:15am 11.00am 11.45am 12.30pm *Please check the booking confirmation for your workshop time.*	The facilitated workshop will take place in and around the zoo grounds, look for the symbol below on the map for specific location. 
Student Learning Booklet *Please ensure each student has a copy on the day of their visit.* Students can develop their understanding by visiting the suggested species. There are specially designed signage and information provided for student research. For deeper understanding and an opportunity to ask inquiry questions, students can access Zoo staff at Keeper Talks and Encounters delivered daily.	*Throughout the Day* The student booklet has been designed so that students can complete it independently, without the aid of a Zoo Educator. We have provided a glossary with all the scientific language to complete the learning. Zoo talk and encounter times can be found here: www.zoo.org.au/times	Please refer to the map for the location of the focus species. These species have bold outlines and have been marked by a binocular symbol. 

Zoo Educators

As qualified teachers, our responsibility is to create interest in the topic, allow opportunities for students to follow-up their question, provide expertise in the area of classification and adaptations, and guide students thinking when working with the skulls and bio-facts.

School Educators

Please note the time for your booked session. Let the Zoo teaching staff know of any needs they have to consider for the students in your class. Where possible, touch base with your students as they walk around the zoo. Question the students about their answers, what they think about the various aspects of Class and Adaptations.

Your Students

As you move around the zoo grounds be sure to reference your workbook to help guide you around the animal precincts. To observe the animals effectively, take your time to;

- watch the animals move around the exhibit.
- look for clues about what they eat.
- how is the enclosure kept secure?
- what enrichment is included in the exhibit?

Use the videos and written information around each exhibit to assist you to get a deeper understanding of the animal's adaptations and classification.

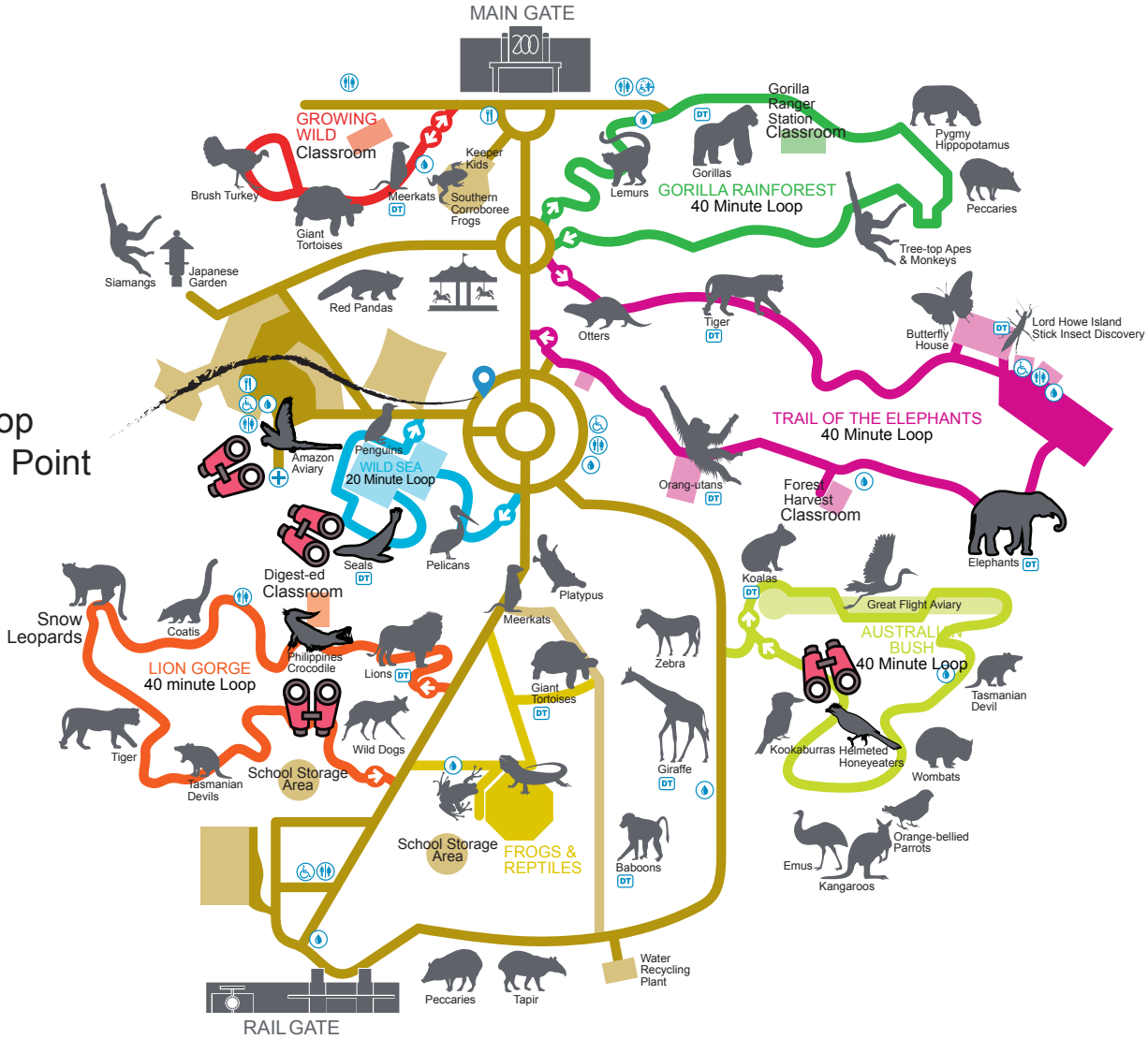
Animal Adaptations and Features

You're coming to the zoo to see our amazing animals as well as some animals that have long been extinct.

The Zoo teachers have designed this booklet to help your students to become animal adaptations and classification experts.

At the back of this booklet there is a glossary of classification and adaptation terms that will assist students to complete this booklet.

Workshop
Meeting Point



Student Entrance

During your day at the zoo you will be directed to go to specific species around the Zoo. These species have binoculars pointing at them and bold outlines. The species that you will be observing are:

- Asian Elephant
- Helmeted Honeyeater
- Australian Fur Seal
- Green Wing Macaw
- Philippine Crocodile

Pre-visit: Adapt or Die!

The world has just experienced an apocalyptic event! Create your own species to survive the apocalypse.

Your Task

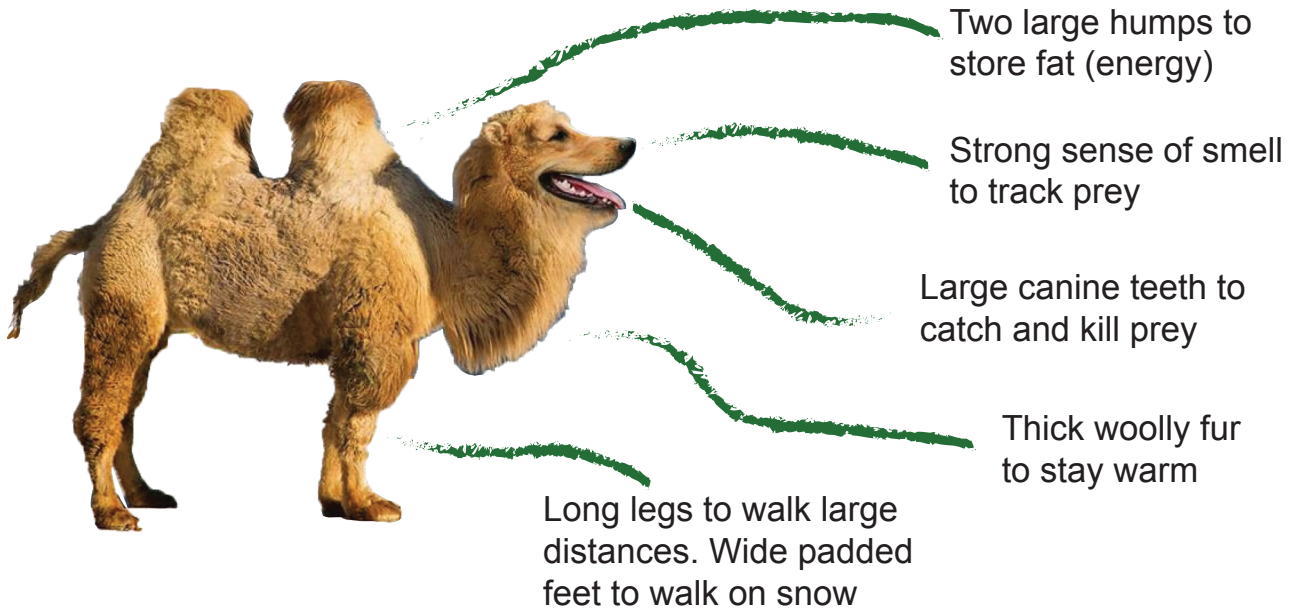
1. Choose one of the natural disasters below and design a new species to survive in the new environment.
2. Draw and annotate your creation.
3. Describe the structural and behavioural adaptations of your new species.
4. Classify your new species

You will need to consider the physical conditions of the environment and the adaptations that your species will need to survive. You should do some research to find out what the environment would be like.

The natural disasters you can choose from are:

- Great flood
- Worldwide volcanic eruption
- Meteor strike
- Ice age

Below is an example of an animal we designed to survive in an environment impacted by a great drought.



Classification:

Name: Golden Camel
Taxa: Mammal
IUCN Status: Extinct

Locomotion: Quardrumed
Diet: Carnivore
Habitat: Montane

Post Visit: School Biodiversity Audit

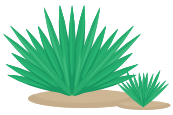
A biodiversity audit is a way to investigate and record what flora and fauna is present in an area. Conducting a biodiversity audit at your school will help you to identify if you have a healthy ecosystem or if you need to add habitat for a category of animal to make it healthier habitat.

Your Task

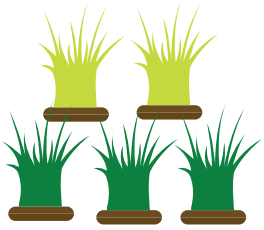
1. **Create** a way to record the livings things in your school grounds.
2. **Designate** an area to conduct your biodiversity audit.
3. **Conduct** your audit and record your results.
4. **Classify** the species that you observe.
5. **Present** your findings in any way you would like.
6. **Evaluate** your findings

You may choose to present your data in a table, graph, infographic or any other visual representation. See below for an example:

3 Native
Tree Species

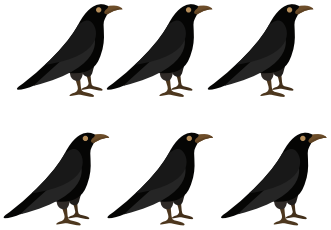


2 Native
Shrub species

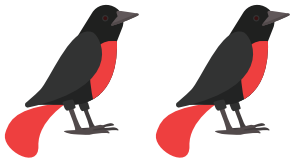


3 Native and 2 Invasive
Groundcover species

0 Native
Amphibian Species

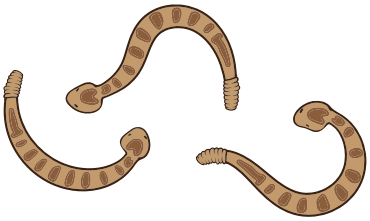


6 Native
Bird Species

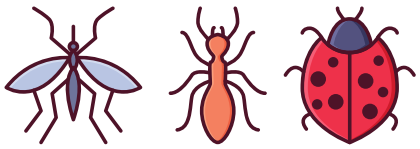


2 Invasive
Bird species

1 Native
Mammal Species



3 Native
Reptile Species



3 Native
Invertebrate Species

Example Evaluation:
Our findings show that we have a fair amount of native vegetation that is attracting a large variety of native birds. Our shrubs and groundcover is providing habitat for Reptile and invertebrate species.

However we found no amphibian species in our school. To attract them we would adapt our behaviour by not using building a frog friendly habitat that includes a small water body.

Post Visit: Adapt a Species to Survive

You now know that species are perfectly adapted to survive in their habitats, however human impacts threatens their ability to survive. Can they adapt quickly enough to survive?

Your Task

1. **Choose** one of the species that you observed while at the Zoo.
2. **Research** how human imapcts threatens their ability to survive.
3. **Modify** the species' adaptations to ensure that it can survive.
4. **Sketch** and **annotate** these new adaptations.
5. **Explain** how these new adaptations will help them to survive.
6. **Classify** your creation. You may need to re-classify the species.
7. **Evaluate** how likely it is for this species to survive.

Species Common name:

Adaptation Annotations:

Sketch your chosen species modified adaptations here

Species threats:

Classification:

The current likelihood of the species survival is...

These new adaptions will help the species survive by...

My Behavioural Adaptation

Can you adapt your behaviour to ensure a species survives?

Your Task

1. Select a species that you are going to help to save from extinction.
2. Identify and describe the effects of their threat/s.
3. Describe how you will adapt your behaviour to have a positive impact on your chosen species.
4. Display this page in your classroom to remind you of your commitment to adapt your behaviour.

My chosen species is the...

Insert a picture of your chosen speices here.

The behaviour I pledge to adapt to ensure the species survives is...

Insert a picture of yourself here.

Assessment Rubric

Student Name

Date:

Criteria Rating					Score
Knowledge	Fragmented communication of information and explanation. Little evidence of knowledge across classification and adaptation.	Has attained a basic level of understanding of classification and adaptation. And how these concepts are linked.	Evidence of expanding his/her knowledge of classification and adaptation. Displays a deeper understanding of the overall concepts.	Defines form and function. Can identify the structure that allows the desired behaviour for the animal. Understands the reasoning behind classification and its importance.	
Comprehension	Displays little understanding of the key concepts of classification and adaptations. Has limited recall of any facts relevant to the topic being covered.	Understands some of the vocabulary used. Is able to explain the processes used to arrive at his/her answer when classifying animals.	The student is able to respond to questions/problems with well thought out answer using the appropriate vocabulary. Can differentiate between structural and behavioural adaptations. Can make connection between structural adaptation and the related behaviour.	Understands animals can be classified using behavioural and structural adaptations. That exceptions exist, and can make insightful reasons for these exceptions. Can justify why animals have certain structural and behavioural adaptations.	
Application	Did not use the resources given to them contained in the student booklet.	Evidence of some use of the resources provided in answering questions both verbal and written.	Uses prior knowledge to complete set tasks. Clear evidence of adapting new knowledge into an existing framework.	Information used to guide a campaign. Begin/introducing the campaign at school where the focus is changing student's adaptations to help an endangered species.	
Analysis	Little or no evidence of compare, contrasting, distinguishing between the systems of classifications and variable adaptations.	Some use of compare, contrasting, distinguishing, between different animal classes and adaptations.	Consistently comparing, contrasting, and distinguishing, between different classes and how these are based on adaptations. Is able to articulate the importance of a system of classification	Comprehensive explanation of how structural and behavioural adaptations assist animals to survive and thrive in their environment. Displays the ability to compare adaptations and their value, demonstrates the ability to contrast the differences within taxa and why they are required.	

Comments:

Glossary

Structural Adaptations

Camouflage: a type of adaptation in appearance which allows an animal to blend in with its surroundings.

Canine teeth: Teeth that are pointed and conical, located between the incisors and premolars.

Incisors: The front cutting teeth located anterior to the canine teeth.

Molars: The rear grinding/shearing teeth located posterior to the premolars.

Body Covering

Skin: the thin layer of tissue forming the natural outer covering of the body of a person or animal.

Scale: made of alpha and beta-keratin and are formed from the epidermis. Found on mish and reptiles.

Fur: hair that covers the bodies of some animals.

Feather: Any of the flat projections growing from a bird's skin and forming its plumage, consisting of a partly hollow firm shaft fringed with vanes of barbs.

Behavioural Adaptations

Basking: Laying still in sun or heated environment to regulate body temperature.

Nest building: creating a dwelling, consisting of natural/unnatural materials with the purpose of shelter specifically raising young.

Diurnal: Refers to animals that are more active during the day.

Nocturnal: Refers to animals that are more active at night time.

Browser: Herbivores that primarily eat twigs, leaves and berries.

Grazer: Herbivores that primarily eat grasses.

Locomotion

Bipedal: Having two feet; two-footed walking on two feet.

Quadrupedal: four-footed; using all four feet for walking and running.

Saltatorial (“Jumping”): movement of animals that hop or jump.

Aerial (“Flight”): is the act of flying.

Arboreal (“Tree climbing”): applies to animals that live in and move through trees.

Aquatic (“Swimming”): describes an animal’s movement in the water.

Defence: a behaviour exhibited by an animal to protect itself from attack.

Habitats

Mountain: Rocky, high altitude often devoid of trees and other vegetation. Extreme cold and at high levels oxygen becomes thin which can make breathing difficult.

Grassland: Characterised by prairies and steppes often low in rainfall. Vegetation is usually grasses, flowering plants and ground covers.

Tundra: Inhabited by tough grasses, mosses and stunted shrubs this treeless landscape is covered in snow for 9 months of the year. Very cold, dry and windy.

Tropical Rainforest: these forests are usually hot and wet receiving anywhere from 200 -1000cm of rain during the year. Vegetation is plentiful with large trees providing a dense canopy with a variety of under story trees and ground covers. This habitat provides one of the richest biomes for life on planet Earth.

Desert: Has no or very little water and extreme high and low temperatures. The substrate is a combination of sand and rock with almost no vegetation. To survive in the desert you need to cope with a small amount of water and extremes of high and low temperatures.

Polar: Great areas of frozen land and sea ice. High winds and sub zero temperatures allow for only the toughest of vegetation to survive. Polar Regions have mountainous and large expanses of open plains.

Aquatic: Refers to bodies of water, such as lakes, rivers, perennial and intermittent streams, wetlands, and estuaries. This habitat can be further classified into 2 areas being salt water and fresh water environments. Vegetation is usually plentiful with plants growing on the banks, in the water as well as under the water surface.

Classifications

Carnivore: Animals that primarily eats meat.

Herbivore: Animals that primarily eats plants.

Omnivore: Animals that eat both plants and meat.

Predator: Animals that attack and eat other animals.

Prey: Animals that are attacked and eaten by other animals.

Bird: Defining classification for birds is the feathered body covering.

Mammal: Are the only animal with mammary glands allowing the mothers to feed their young milk.

Reptile: Scaled body covering, respiration through lungs, ectothermic (an animal which cannot regulate its own body temperature, so its body temperature fluctuates according to its surroundings).

Amphibian: Usually born in or near water, their body is covered in moist skin. They are distinguished by having an aquatic gill-breathing larval stage followed by a terrestrial lung-breathing adult stage.

Fish: Are vertebrates which live in water and absorb oxygen from their environment using gills. They have two sets of paired fins and several unpaired fins.

Vertebrate: animals with a backbone.

Invertebrate: animals without a backbone.

IUCN Conservation Status

Least Concern: Does not qualify for a more at risk category. Widespread and abundant species.

Near Threatened: Assigned to species or lower taxa that may be considered threatened in the future.

Vulnerable: Considered to be facing a high risk of extinction in the wild.

Endangered: Considered to be facing a very high risk of extinction in the wild.

Critically Endangered: Facing an extremely high risk of extinction in the wild in the near future.

Extinct in the Wild: The species only survives in captivity (eg; Zoos, Aquariums).

Extinct: There is no reasonable doubt that the last animal has died.

Threats - Human Impact

Climate Change: Any significant long-term change in the expected patterns of average weather of a region over a significant period of time. (eg. extreme heat events, prolonged snow or storm

Habitat Loss: Habitat is lost and degraded when natural or anthropogenic (human) activities damage and destroy habitat to such an extent that it is no longer capable of supporting the species and ecological communities that naturally occur there

Introduced Species: An invasive species is an organism that is not indigenous, or native, to a particular area. Invasive species can cause great economic and environmental harm to the new area.

Poaching: Poaching has been defined as the illegal hunting or capturing of wild animals, usually for economic or subsistence life style.

Pollution: The presence in or introduction into the environment of a substance which has harmful or poisonous effects.

Disease: An impairment of the normal state of an animal that interrupts or modifies its vital functions.