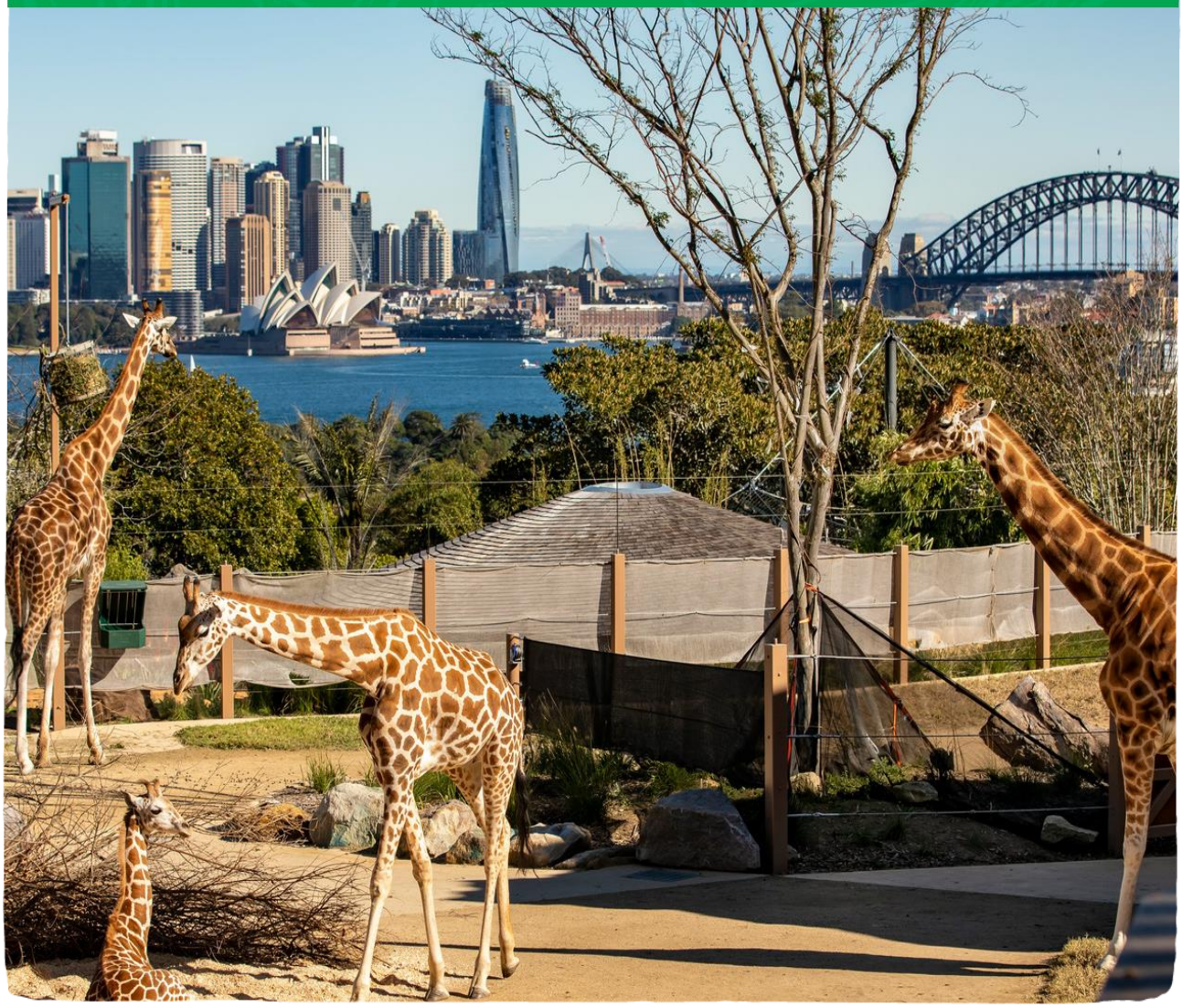
OBSERVING ANIMAL BEHAVIOUR

WORKSHOP RESOURCE

Year 11 Investigating Science – Observing Animal Behaviour

Stage: 6 Outcomes:
INS11/12-1, INS, 11/12-2, INS11/12-3, INS11/12-7, INS11-8, INS11-9



Key inquiry Questions:

- How does observation instigate scientific investigation?
- What are the benefits and drawbacks of qualitative and quantitative observations
- How does primary data provide evidence for further investigation
- How does the collection and presentation of primary data affect the outcome of scientific investigation

Learning Intentions

Students will develop the skills to ask scientific questions and collect objective data based on their observations of the animals at Taronga.

Success Criteria

I can collect appropriate data to conduct a scientific investigation that has a hypothesis and answers a scientific question.

TARONGA ZOO SYDNEY
For the Wild

EVALUATING THE SCIENTIFIC METHOD

Year 11 Investigating Science – Observing Animal Behaviour

SCIENCE BEGINS WITH OBSERVATION

It is human nature to ask questions, those questions are a result of observations of the unknown.

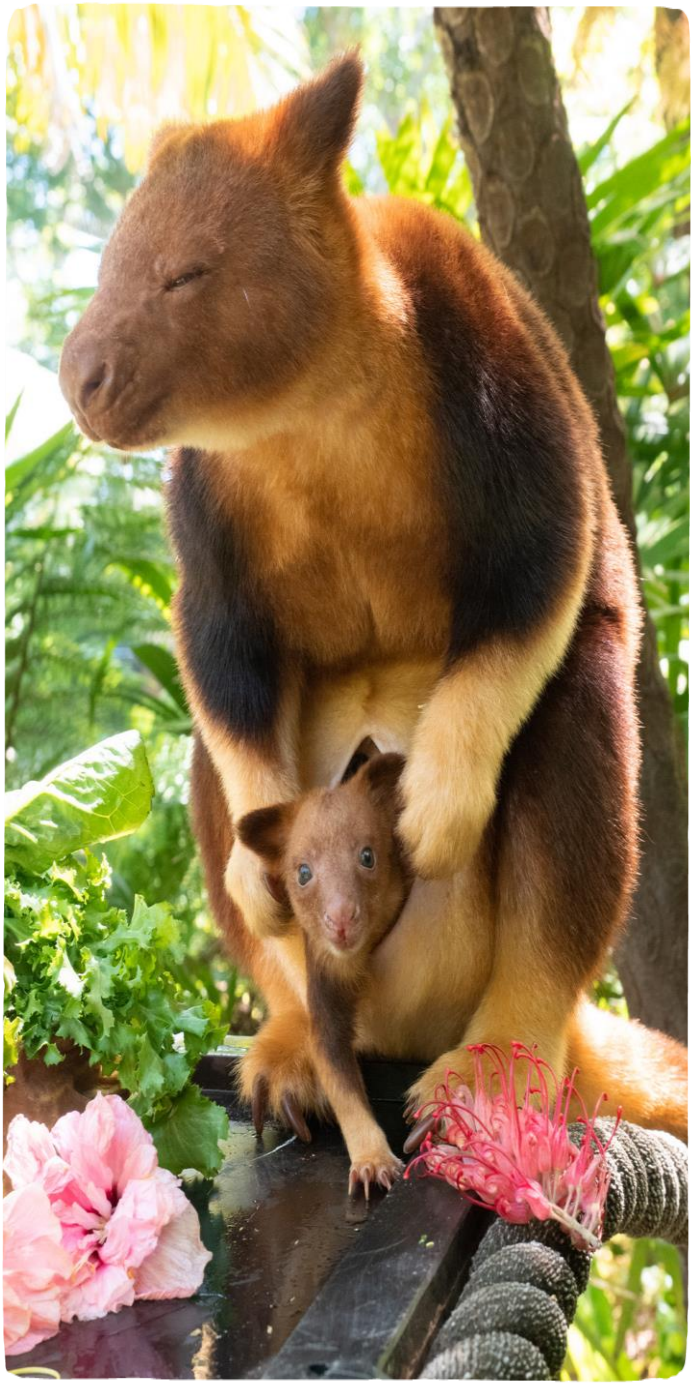
All human knowledge is a result of questions asked by those who came before us. Formally this is known as the scientific method and at school we understand the following important steps.

1. Observation
2. Questioning
3. Forming a hypothesis
4. Experimenting
5. Data analysis and conclusion

Unfortunately, the first step of observation is often overlooked and as a result it can be difficult to derive a genuine question.

The activities in this resource will allow the collection of primary data that can be used toscientific questions and also collect data to answer questions.

The on site data collection is authentic and will be used by Taronga Scientists to assist with the understanding of how animals are using their exhibits. The methods for data collection are universal and can easily be transferred to collecting similar data on animals in a school playground or at home.



PRE-VISIT ACTIVITIES

At the zoo you will be broadening your understanding of enrichment and collecting primary data via an ethogram.

What is an Ethogram

An ethogram is a record of behaviours exhibited by an animal that is developed from a list of pre-determined, species-specific behaviours showing how an individual animal, and/or group spends its time. Over time, observations collected using an ethogram can determine the overall activity budget of what the animal is doing day to day.

Ethograms are used to study animals to learn and define what behaviours are typical and which ones may be abnormal. They are used to monitor the health and stability of a group through group interactions, and we can even learn about new, previously unobserved behaviours through this process and what they can tell us about the animals and their surroundings. Ethograms can also help us learn about changes in behaviour that might be related to disease, changes in social dynamics, reactions to changes within their environment, interactions with interventions (ie: enrichment) and/or other stresses or threats to the animals, their groups, or even an entire species.

Through monitoring behaviours using ethograms, we can learn, adapt, change and implement mechanisms that contribute to improving the overall welfare and conservation outcomes for animals.

What is Enrichment

Enrichment is any adjustment to an animals environment that improves their welfare. Enrichment should be goal-based, that means, strategies should target wild-type behaviours known to be expressed by a species. It is a process that improves animal welfare by providing opportunities for a broad range of naturalistic behaviours to be expressed, aids in reducing undesirable behaviours, and provides animals with choice, allowing greater control over their environment. This sense of control can lead to positive mental states for animals in human-care.

Enrichment is not simply a thing but a process with a scientific underpinning. Keepers seek to understand how animals behave in the wild and then compare this to how animals behave in zoos. We can then determine species-specific behaviours to target, plan, and implement various strategies to achieve these. It is important to document and evaluate the responses to these to ensure the enrichment strategies are effective. This is a cyclic process and continues across an animals' lifespan.

Broadly, enrichment can be categorised as physical, sensory, cognitive, food-based, and social. For example, sensory strategies might consider the different temperature ranges an animal may naturally be exposed to and the resulting behaviours. An animal may seek opportunities to cool themselves in hot conditions or warm themselves when temperatures drop.

PRE-VISIT ACTIVITIES

Ethogram Activity

Watch the videos below.

Use the 'Identifying and Describing behaviours' sheets on the following pages to record what you consider relevant behaviours and describe specifically what this behaviour looks like.

Discuss with your peers and see if you have common descriptions for the behaviours observed.

https://bcove.video/3yXjIam

https://bcove.video/3X7VT7E

https://bcove.video/3AS9pEX

Record any specific behaviours you notice on the 'Identifying and Describing Behaviours' sheet on the following pages

What are the main behaviours have you noticed in the videos?

Describe some actions that were hard to differentiate or label

IDENTIFYING AND DESCRIBING BEHAVIOURS

Fill out these ethograms for at least two of the four animals in the videos

Create the foundation for your ethogram by completing the behaviour description table. List and code behaviours you observed and describe them. Your description should not repeat the label i.e. walking is walking. Instead use: **walking forward (WF)| vertical movement, one foot in front of the other, at least one foot on the ground at all times** (in this case WF is the code).

Animal:

Behaviour Label	Behaviour Description

Animal:

Behaviour Label	Behaviour Description

IDENTIFYING AND DESCRIBING BEHAVIOURS

Fill out these ethograms for at least two of the four animals in the videos

Create the foundation for your ethogram by completing the behaviour description table. List and code behaviours you observed and describe them. Your description should not repeat the label i.e. walking is walking. Instead use: **walking forward (WF)| vertical movement, one foot in front of the other, at least one foot on the ground at all times** (in this case WF is the code).

Animal:

Behaviour Label	Behaviour Description

Animal:

Behaviour Label	Behaviour Description

IDENTIFYING AND DESCRIBING BEHAVIOURS

Fill out these ethograms for at least two animals in the videos and one in the playground

Create the foundation for your ethogram by completing the behaviour description table. List and code behaviours you observed and describe them. Your description should not repeat the label i.e. walking is walking Instead use: **walking forward (WF)l vertical movement, one foot in front of the other, at least one foot on the ground at all times** (in this case WF is the code).

Animal:

Behaviour Label	Behaviour Description

Animal:

Behaviour Label	Behaviour Description

HOW DOES OBSERVATION INSTIGATE INVESTIGATION?

What is the difference between seeing and observing?

What is the difference between an observation and an inference?

Develop a one-minute experimental design based on an unknown observation

How might observing animal behaviour change:

At home?

At the zoo?

In the wild?

Why do we observe and record animal behaviour?

Explain the importance ongoing behaviour observation with regard to understanding patterns

What are the features of a good hypothesis?

TASK 1: FOCAL SAMPLING – SUMATRAN TIGER

Use the predetermined behaviours listed to complete the ethogram.
Watch one animal for 15 minutes. Each minute if you observe one of the target behaviours put a tally in the corresponding box. *Note: you can mark multiple different behaviours each minute but only one mark for each behaviour.

Name of Observers:	Date:	Weather:
Animal/species Observed: Sumatran Tiger		
Identifying features of individual animal selected for focal sampling tasks:		

Behaviour	Code	Description
Climbing	C	Scaling a tree or object
Digging	D	Using paws to displace earth
Eating	E	Consuming food, chewing on branches/grass
Grooming	G	Tiger is licking itself, or moving paws over face/other part of it's body
Out of Sight	OOS	Animal can not be seen
Running	RUN	Moving from one point to another at speed
Scent Marking	P	Spraying urine and/or dragging paws on objects
Sitting	SI	Back legs folded and hindquarters on ground with front legs straight and forequarters off the ground
Lie/resting	R	
Sleeping	ZZZ	Tiger is laying on the ground, head down and eyes closed
Sniffing	SN	Putting nose by ground/object
Standing	ST	Body completely off the ground and weight spread across all limbs
Walking	W	Moving from one point to another at a relaxed pace
Behaviour - other	O	Other behaviour expressed that is not listed above

	Behaviours												
Time	C	D	E	G	OOS	R	P	SI	ZZZ	SN	ST	W	O
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

What was the primary behaviour you noticed in this ethogram?

Was there enrichment in this habitat?

Did you see the animal engage with this enrichment?

TASK 1: FOCAL SAMPLING – CHIMPANZEE

Use the predetermined behaviours listed to complete the ethogram.
Watch one animal for 15 minutes. Each minute if you observe one of the target behaviours put a tally in the corresponding box. *Note: you can mark multiple different behaviours each minute but only one mark for each behaviour.

Name of Observers:	Date:	Weather:
Animal/species Observed: Chimpanzee		
Identifying features of individual animal selected for focal sampling tasks:		

Behaviour	Code	Description
Explore/Investigate	E	Exploratory or manipulative behaviour not related to food. Includes move while sniffing the ground or objects, sniffing the air, manipulating objects
Feed/Forage	F	Feeding or manipulating food items or enrichment feeders. Includes looking for food if it is known that food is present (e.g. food under leaves - animal digging in leaves). If it is not clear that food is present, mark as Explore / Investigate.
Groom initiator	GI	licking or scratching any part of another individuals body.
Groom recipient	GR	Another individual is licking or scratching any part of their body.
Lie/Rest	R	Animal is lying down, head may be down or up. Includes lying on structures/trees.
Move	M	Purposeful movement from one place to another; includes walk, run, climb
Other	O	A behaviour not described here
Out of sight	OOS	Animal not visible
Sit/Stand	S	Animal is sitting (supported on forelimbs) or standing (quadrupedal or bipedal). Includes sitting or standing where there is no other concurrent behaviour such as explore, groom or feed.

	Behaviours								
Time	E	F	GI	GR	R	M	O	OOS	S
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

What was the primary behaviour you noticed in this ethogram?

Was there enrichment in this habitat?

Did you see the animal engage with this enrichment?

TASK 1: FOCAL SAMPLING – GORILLA

Use the predetermined behaviours listed to complete the ethogram.
Watch one animal for 15 minutes. Each minute if you observe one of the target behaviours put a tally in the corresponding box. *Note: you can mark multiple different behaviours each minute but only one mark for each behaviour.

Name of Observers:	Date:	Weather:
Animal/species Observed: Gorilla		
Identifying features of individual animal selected for focal sampling tasks:		

Behaviour	Code	Description
Explore/Investigate	E	Exploratory or manipulative behaviour not related to food. Includes move while sniffing the ground or objects, sniffing the air, manipulating objects
Feed/Forage	F	Feeding or manipulating food items or enrichment feeders. Includes looking for food if it is known that food is present (e.g. food under leaves - animal digging in leaves). If it is not clear that food is present, mark as Explore / Investigate.
Groom initiator	GI	licking or scratching any part of another individuals body.
Groom recipient	GR	Another individual is licking or scratching any part of their body.
Lie/Rest	R	Animal is lying down, head may be down or up. Includes lying on structures/trees.
Move	M	Purposeful movement from one place to another; includes walk, run, climb
Other	O	A behaviour not described here
Out of sight	OOS	Animal not visible
Sit/Stand	S	Animal is sitting (supported on forelimbs) or standing (quadrupedal or bipedal). Includes sitting or standing where there is no other concurrent behaviour such as explore, groom or feed.

	Behaviours								
Time	E	F	GI	GR	R	M	O	OOS	S
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

What was the primary behaviour you noticed in this ethogram?

Was there enrichment in this habitat?

Did you see the animal engage with this enrichment?

TASK 1: FOCAL SAMPLING – RED PANDA

Use the predetermined behaviours listed to complete the ethogram.
Watch one animal for 15 minutes. Each minute if you observe one of the target behaviours put a tally in the corresponding box. *Note: you can mark multiple different behaviours each minute but only one mark for each behaviour.

Name of Observers:	Date:	Weather:
Animal/species Observed: Red Panda		
Identifying features of individual animal selected for focal sampling tasks:		

Behaviour	Code	Description
Climbing	C	Animal is moving along vertical or horizontal structures or trees and is not in contact with the ground
Digging	DI	Digging or rooting in the ground with paws or muzzle
Drink	DR	Drinking water
Feeding	F	Eating browse or food provision in enclosure
Exploratory	E	Animal exploring, investigating or manipulating something other than an enrichment item. May include sniffing, licking
Groom self	G	Animal is scratching or grooming itself
Hanging	H	Animal is hanging from a tree or structure
Lying	L	Head up, eyes open, reaction to surroundings in some manner (e.g. head or ear movement) Asleep, unresponsive to noise/activity
Moving	M	Animal is using all four limbs to walk, run, or bound on the ground
Out of sight	OOS	Animal can not be seen
Rubbing	R	Rubbing muzzle or body on ground or object
Scratching	S	Using claws to rake across ground or object
Self Play	SP	Purposeless activity with self (e.g. rolling, tale chasing), but not repetitive
Sitting	SI	Animal is sitting with front paws on the ground
Standing	ST	Animal is standing on two rear limbs

	Behaviours														
Time	C	DI	DR	F	E	G	H	L	M	OOS	R	S	SP	SI	ST
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															

What was the primary behaviour you noticed in this ethogram?

Was there enrichment in this habitat?

Did you see the animal engage with this enrichment?

TASK 1: FOCAL SAMPLING – OWN ANIMAL (CLASSROOM)

Using the examples on the previous pages develop behaviour descriptions for your own animal. Complete an ethogram for that animal by watching one animal in the exhibit for 5 minutes. Each minute if you observe one of the target behaviours put a tally in the corresponding box to. *Note: you can mark multiple different behaviours each minute but only one mark for each behaviour.

Name of Observers:	Date:	Weather:
Animal/species Observed:		
Identifying features of individual animal selected for focal sampling tasks:		

Behaviour	Code	Description

	Behaviours								
Time									
1									
2									
3									
4									
5									

What was the main behaviour you noticed in this ethogram?

Your observation was only five minutes, would you expect to see any other behaviours if this was recorded at different times?

Was there any activity that influenced this behaviour?

Did you see the animal engage with any enrichment?

TASK 2: FOCAL SAMPLING – OWN ANIMAL (ZOO GROUNDS)

Using the examples on the previous pages develop behaviour descriptions for your own animal. Complete an ethogram for that animal by watching one animal in the exhibit for 15 minutes. Each minute if you observe one of the target behaviours put a tally in the corresponding box to. *Note: you can mark multiple different behaviours each minute but only one mark for each behaviour.

Name of Observers:	Date:	Weather:
Animal/species Observed:		
Identifying features of individual animal selected for focal sampling tasks:		

Behaviour	Code	Description

	Behaviours								
Time									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

What was the main behaviour you noticed in this ethogram?

Was there enrichment in this habitat?

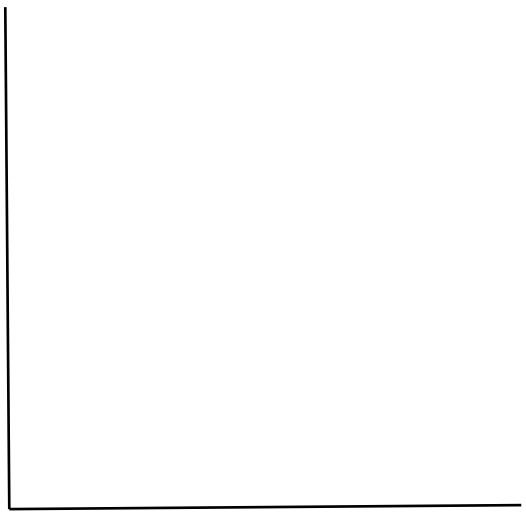
Did you see the animal engage with this enrichment?

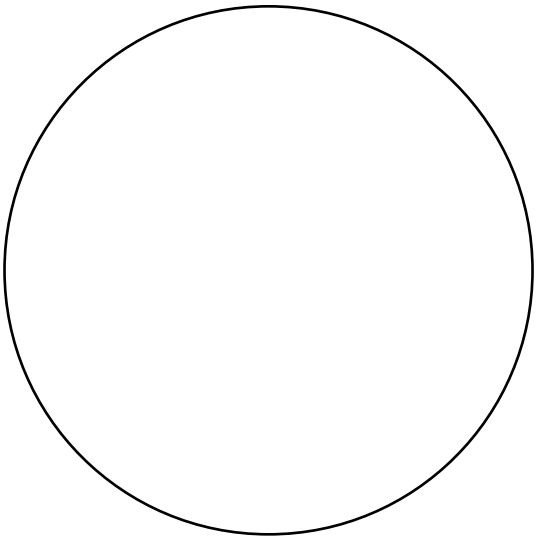
TASK 1 - QUESTIONS

1. Group the behaviours you observed during your sampling, remember to be objective and avoid inferring the meaning of behaviours observed e.g. looked hungry

2. The sampling methods used to collect your data are both qualitative and quantitative. Which sampling method is qualitative and which is quantitative? Describe some advantages and disadvantages for each method.

3. Graph the data you have collected from the Time Sampling ethogram using two different methods (see suggestions below). Compare the different graphing methods and discuss the advantages and disadvantages for each method.





DEVELOPING AN EXPERIMENTBASED ON OBSERVING ANIMAL BEHAVIOUR

Zoo Based Populations

Utilise secondary sources to research an animal you conducted an ethogram on. Based on what you learn, design some enrichment that will promote the desired behaviour in the animal for an appropriate amount of time
Develop a question that you would be testing while the animal is interacting with the piece and what you would be collecting.

Playground or Domestic Animals

Use the skills you learnt at the zoo to make observations of animals you interact with on a daily basis, either at school or at home.

Once you have made your preliminary observations develop a question and spend time collating appropriate data.

You may be able to design something specific for your pet. However, at school you might design specific questions about birds (or other animals) in your playground to help understand:
-The specific times or locations certain birds use the playground.
-The types of birds in certain sections of the playground.
-How birds use the space and potentially how you could encourage or discourage their activity.

Make sure your question is clear with a testable hypothesis and objective variables.

ALTERNATE ETHOGRAM SCAFFOLD

Locate your chosen animal and complete each task as indicated below. This task is best done in pairs so that you can capture all the behaviours as well as keep an eye on the time.

Name of Observers:	Date:
Animal/species Observed:	
Weather Conditions:	
Identifying features of individual animal selected for focal sampling tasks:	

Ad lib sampling – duration 5 minutes	**Focal sampling – duration 5minutes**
For all animals in the enclosure, record all observed behaviours. Once complete try and group your observations into groups	Now choose only one animal in the environment. In this column, list all the grouped behaviours observed in the previous observation. Each minute, tally which of your chosen animal exhibits the behaviours recorded in the first column.
Start Time: End Time:	Start Time: End Time:

ALTERNATE ETHOGRAM INSTANTANEOUS SAMPLING (OPTIONAL)

For this observation you will record the behaviour of an individual animal every 15 seconds for a period of 5 minutes. This task is best done in pairs so that you can capture all the behaviours as well as keep an eye on the time.

Name of Observers:	Date:
Start time:	End time:
Identifying features of individual animal selected for focal sampling tasks:	

Time	**Behaviour**
0	
15s	
30s	
45s	
1m	
1m 15s	
1m 30s	
1m 45s	
2m	
2m 15s	
2m 30s	
2m 45s	
3m	
3m 15s	
3m 30s	
3m 45s	
4m	
4m 15s	
4m 30s	
4m 45s	
5m	