

# The Living World

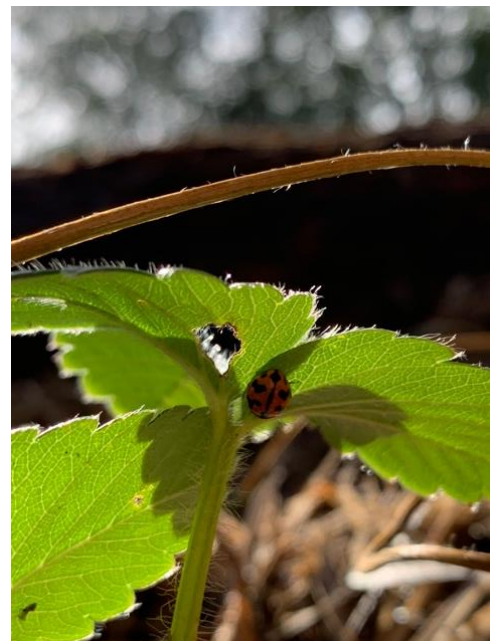
## Nature at Nurragingy

The job of an ecologist is to record and monitor species in their natural habitat and to become involved in protecting and caring for the environment they live in. We need some Stage 2 ecologists in training to study the interactions between living things and their environment at Nurragingy Reserve and to determine whether it is a healthy ecosystem.

You will need to do some work in the field to graduate as a Nurragingy Ecologist. Your scientific investigation will focus on identifying plant and animal species and understanding the life cycles of plants and animals at Nurragingy Reserve. It will highlight the interconnections between plant and animals and their environment.

### Inquiry Questions:

- How can we group living things?
- What are the similarities and differences between the life cycles of living things?
- How are environments and living things interdependent?



### Health and Safety Issues

As you are working out in the field you need to be aware that:

- Ground material is often covered in moss and can be very slippery.
- Vines and dense undergrowth can trip.
- Fallen trees can be rotten and weak.
- Some animals can deliver painful or venomous bites.
- On slopes, rocks can be easily dislodged.

### Success Criteria:

#### I Can:

- use a dichotomous key to identify plant species
- explain the meaning of the words abundance and diversity
- describe how plants and animals depend on each other to survive
- identify two pollinating and two seed dispersing animals
- describe things that might have a negative impact on water quality at Nurragingy
- describe things that might have a negative impact on health of the woodland at Nurragingy

Student Name: \_\_\_\_\_

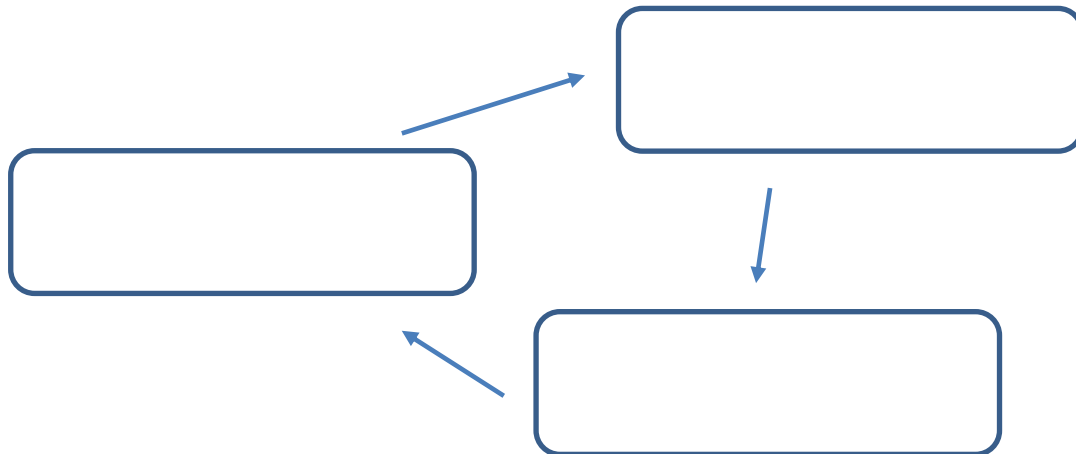
## Inquiry aim:

As ecologists you will conduct a scientific investigation to understand the living world, with a focus on Nurragingy Reserve in Western Sydney. You will conduct field research on the biodiversity within the reserve by identifying and surveying a number of snapshot species. You will be evaluating the interconnections between these plants and animals, and the environment in which they live to determine the health of the ecosystem at the Reserve.

## Pre-visit tasks: Nature at Nurragingy

**Complete this section at school before your Brewongle Excursion**

1. Choose an animal you know of which looks different at different stages of its life. Draw or write the stages in the graphic below.



2. Plants have life cycles too! Watch the following YouTube video about the plant life cycle. <https://youtu.be/Avrbtt7izP4>
3. Walk around your school grounds and fill in the table below with detailed pictures or words.

Plants at different stages of their life cycle (flowers, fruit, seeds)	Pollinators (insects that transfer pollen between plants)

4. Watch the following YouTube video. Make a list of all the ways seeds can be dispersed (moved) around the bush.

<https://youtu.be/nJAbo-F6tO4>

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5. A healthy ecosystem will have lots of pollinating and seed dispersing animals to pollinate the plants and help them disperse their seeds. Your excursion to Nurragingy will give you a chance to survey the environment there, finding evidence to determine whether the environment is healthy or unhealthy.

*What makes a healthy ecosystem?*

- *Biodiversity (a range of different plant and animal species), including plants, animals and insects*
- *Water - clean and fresh water for plants and animals*

Scientists learn about things by coming up with testable questions. "Testable" means they can test or survey something to answer their question.

With your buddy next to you, do a "think, pair, share" session to come up with some testable questions on what you would like to know / test at Nurragingy.

Testable question 1:

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Testable question 2:

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Testable question 3 (general or overall question):

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# At Nurragingy Reserve

## Identifying plants – natives vs weeds

A dichotomous key is a tool that can be used to identify organisms or objects in the natural world, such as plants, animals, or rocks. The word dichotomous is derived from the Greek words meaning “two parts”. The key consists of a series of paired statements or clues about features or characteristics.

Use a dichotomous key to identify the main plant species in the area. List and tally the plant species below. Tick whether they are native plants or weeds.

Plant name	Tally (number)	Native (tick)	Weed (tick)

RATING RESULT	
All weeds	Unhealthy
3 to 5 weed species Up to 10 native species	Moderately healthy
0 weeds	Healthy

# Bugs underground

## How are plants and animals connected?

Many bugs found underground are in the larval stage of their life cycle. Some of these larva feed on the roots of trees while underground!

Some insects (mostly ants) love to eat the tasty part on the outside of the seeds of plants. The ants will travel long distances to collect seeds to take back to their underground nest.

*Can you think how this might help plants?*












Animal name	Tally (number)

RATING RESULT	
6 – 17	Unhealthy
18 – 24	Moderately healthy
25 – 50	Healthy

# Pollinators & dispersers

## LEAVE CLIPBOARDS BEHIND FOR THIS ACTIVITY!

Most plants wouldn't exist without insects and other animals to pollinate flowers and disperse seeds. Walking through the bush, search for examples or evidence of pollinating or seed dispersing animals. RECORD YOUR DATA IN THE TABLE WHEN YOU RETURN.

Animal name & identifying features	Role in plant life cycle (Pollinator or Disperser)	Tally (number)
 Native bee (5-7mm)		
 Honey bee (10-15mm)		
 Butterfly (various sizes)		
 Ladybug (5-7mm)		
 Moth (various sizes)		
 Wasp (15-20mm)		
 Ringtail possum (15-20cm long, white tip on tail)		
 Brush-tailed possum (cat size)		
 Ant (5-20mm)		
 Seed-eating bird (hook shaped beak)		
 Nectar-eating bird (pointy narrow beak)		

RATING RESULT	
6 – 17	Unhealthy
18 – 24	Moderately healthy
25 – 50	Healthy

# Water quality

**Did you know?**

- Nurragingy is surrounded by urban areas (lots of roads, houses, etc)
- Stormwater washes over urban surfaces and into the ponds at Nurragingy. How do you think this might impact the water quality? How would we test this?

	STORM WATER RESULT	RESULT RANGE	RATING	YOUR RATING
<b>TEMPERATURE</b>		0 - 6°	2	
		7 - 11°	4	
		12 - 20°	10	
		21° +	2	
<b>SALINITY</b>		0 – 50	10	
		51 – 300	8	
		301 – 500	5	
		501 +	2	
<b>pH</b>		<6	2	
		6-8	10	
		>8	2	
<b>TURBIDITY</b>		<10	10	
		10 – 20	8	
		20 – 50	5	
		>50	2	
<b>TOTAL RATING</b>				

RATING RESULT	
6 - 17	Unhealthy
18 - 29	Moderately healthy
30 - 40	Healthy

# Post-visit activities

## Summary

Write your testable questions in the spaces below, then use your data as evidence to answer them.

Testable question 1:

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Answer:

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Evidence to support your answer:

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Testable question 2:

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Answer:

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Evidence to support your answer:

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Testable question 3 (general or overall question):

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Answer:

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Evidence to support your answer:

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## Scientific Report

As a whole class, work together to write a 1 - 2 page scientific report to present your findings. Use the following headings for paragraphs:

- Title (your general testable question)
- Abstract (2-3 sentences outlining what you did and what you found)
- Introduction (background of the site and the reason for your research. Include relevant information from the pre-excursion questions and your diagrams)
- Method (explain the surveys you did - how you collected your data)
- Results (tables and graphs of your data)
- Discussion (what your data means - explain what you found. Discuss your results. Were the tests fair?)
- Conclusion (is there anything more you would like to know about the site? Suggestions for further research)