

# Corroboree Frog Education Kit



Copyright © Wirraminna Environmental Education Centre 2013

This work is licensed under the Creative Commons Attribution - Noncommercial - Share Alike 3.0 Australia License. This licence allows for distribution, remixing and building upon the work, but only if it is for non-commercial purposes, the original creator/s (and any other nominated parties) are credited and the derivative works is licensed under the same terms. To view a copy of the license, visit [www.creativecommons.org/licenses/by-nc-sa/3.0/au/](http://www.creativecommons.org/licenses/by-nc-sa/3.0/au/)

**Citation:** Coleman, P., Coleman, K. 2013. *Corroboree Frog Education Kit*. Wirraminna Environmental Education Centre, NSW.

#### Project Partners

- Murray Catchment Management Authority
- Murray Darling Association
- Burrumbuttock Public School
- Wirraminna Environmental Education Centre

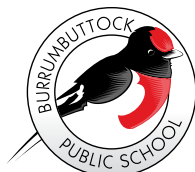
**Acknowledgements:** Owen Dunlop (Wirraminna EEC), David Hunter (Office of Environment and Heritage), Stacey Staunton-Latimer (Wirraminna EEC), Taronga Zoo and Zoos Victoria, Jason Robbins Photography

This resource has been prepared by Peter & Kelly Coleman of Peekdesigns for Wirraminna Environmental Education Centre.



#### Wirraminna Environmental Education Centre

via Burrumbuttock Public School  
Howlong Road, BURRUMBUTTOCK NSW 2642  
Tel: 02 6029 3253 | Fax: 02 6029 3235  
[www.wirraminna.org](http://www.wirraminna.org)  
Email: [owen.dunlop@det.nsw.edu.au](mailto:owen.dunlop@det.nsw.edu.au)



**Catchment Management Authority**  
Murray

# The journey begins...

The iconic Southern Corroboree Frog is only found in the wild in Kosciuszko National Park. This species is critically endangered with less than 50 individuals left in the wild. This resource has been created with the aim of helping students and teachers learn about Corroboree Frogs and their fight for survival. Hopefully by raising awareness about Corroboree Frogs the community can support recovery programs to help save this species.

Wirraminna Environmental Education Centre (EEC) Burrumbuttock, located in the Murray Catchment, is home to eight endangered Southern Corroboree Frogs (*Pseudophryne corroboree*). The frogs have been provided by Taronga Zoo from their captive breeding program, which has been operating since 2006 as part of the Southern Corroboree Frog Recovery Project.

Wirraminna EEC is one of only three locations in Australia (other than zoos) where these tiny, yellow and black frogs can be viewed in captivity. The other two enclosures are found at the NSW National Parks and Wildlife Service Snowy Region visitor centre (located at Jindabyne) and Tumut Region visitor centre. The enclosure is the result of extensive work by staff and volunteers at Wirraminna EEC, and members of the Corroboree Frog Recovery Team, including the Office of Environment and Heritage (OEH), Taronga Zoo, and the Murray Catchment Management Authority (CMA).

Murray CMA has provided funds for the development and maintenance of the Wirraminna EEC enclosure through the Australian Government's Caring for Our Country program. Murray CMA has been involved in the Corroboree Frog recovery program since 2006, signing a Memorandum of Understanding (MOU) with Taronga Zoo in 2010. As part of this MOU, Murray CMA assists with Corroboree Frog related educational activities in the Murray catchment and maintains a website, through which donations for the captive breeding program are accepted.

Wirraminna EEC will maintain the enclosure into the future, with the frogs on display to the public. The display forms part of a Southern Corroboree Frog educational program being developed by Wirraminna EEC staff, including Owen Dunlop, Stacey Staunton-Latimer (Education Officer) and Dr Maggie Watson.



# Contents

<i>The journey begins.....</i>	<i>iii</i>
Corroboree Frogs and the Murray Catchment Management Authority .....	1
Wirraminna Environmental Education Centre .....	2
Creative Catchment Kids .....	2
Fact Sheet 1: Corroboree Frogs .....	3
Fact Sheet 2: A whole lot of life .....	5
Fact Sheet 3: Species and communities under threat .....	6
Fun frog origami .....	7
Stage 2 - Corroboree Frog education .....	9
Activity 2.1: What it means to be living .....	10
Activity 2.2: Living versus non-living .....	12
Activity 2.3: Classifying living things .....	14
Activity 2.4: What you know about the Corroboree Frog .....	16
Activity 2.5: Corroboree Frog life cycle .....	18
Activity 2.6: Comparing life cycles .....	21
Stage 3 - Corroboree Frog education .....	22
Activity 3.1: Natural selection .....	23
Activity 3.2: Frog structural adaptations .....	24
Activity 3.3: Corroboree Frog adaptations .....	26
Activity 3.4: What is habitat? .....	29
Activity 3.5: Living in an extreme environment .....	30
Activity 3.6: Saving the Corroboree Frogs .....	31



# Corroboree Frogs and the Murray Catchment Management Authority

Corroboree Frogs are Australia's most iconic amphibian species and amongst the most visually spectacular frogs in the world.

Corroboree Frogs are only found in a small area of south-eastern NSW and have suffered major declines and range contraction over the last three decades.

The Murray catchment now contains the only wild populations of Southern Corroboree Frogs in the world.

Through funding obtained from the Natural Heritage Trust, the Murray Catchment Management Authority (CMA) has been involved in a close partnership with the NSW Office of Environment and Heritage, Taronga Zoo, the Amphibian Research Centre and Zoos Victoria to implement the National Recovery Program for Corroboree Frogs.

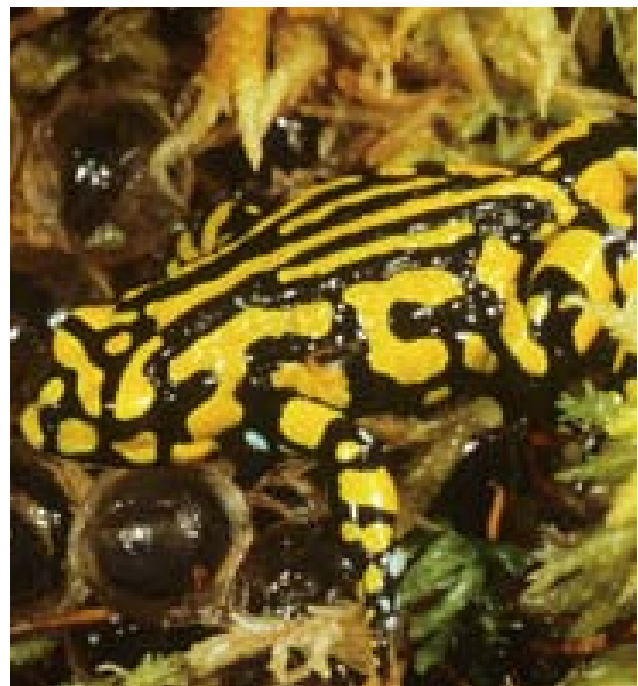
The current focus of the recovery program is to establish several viable captive breeding populations, and assess methods for reintroduction of Corroboree Frogs into the wild.

The program now has successful captive breeding programs at Taronga Zoo, Melbourne Zoo, Healesville Sanctuary, Tidbinbilla Nature Reserve and the Amphibian Research Centre in Melbourne. The team has also carried out successful reintroductions of Corroboree Frog adults and tadpoles into the wild and we hope that this is the beginning of more success in recovering this amazing species.

Since the Corroboree Frog conservation website and trust was launched by Minister Peter Garrett in Albury in May 2009, over \$22,000 in sponsorship has been raised to support Corroboree Frog conservation.

For more information on Corroboree Frogs and the recovery program visit:

**[www.corroboreefrog.org.au](http://www.corroboreefrog.org.au)**



# Wirraminna Environmental Education Centre

Wirraminna occupies four hectares of formerly unused ground around an old government dam, between the school and the recreation ground in Burrumbuttock, 30 km north west of Albury, in southern NSW. From its beginning in 1995, it has developed into an environmental education centre that provides opportunities for discovery and learning about the natural environment, the ecology of woodlands and the beauty of native plants for our gardens. Over 2000 primary school children visit Wirraminna annually from schools throughout the region. It also provides a popular outing for clubs and organisations in the district, and many locals and visitors to the region call in to explore the gardens and learn about our local environment, from the extensive interpretative signage around the park.



Wirraminna has been created and is maintained by a group of dedicated volunteers, and has been supported by a wide range of funding sources, including local government, local businesses, Natural Heritage Trust, private charities and Landcare Australia. There are very strong links with Burrumbuttock Public School and Wirraminna which have been awarded State and National Landcare awards in education. The achievements at Wirraminna have inspired many other local schools to make better use of their grounds for environmental education.



Wirraminna EEC is continually evolving and sharing our story and interest in the natural environment and how it can be protected and enhanced.

[www.wirraminna.org](http://www.wirraminna.org)

## Creative Catchment Kids

Creative Catchment Kids is an innovative education program commenced in 2010 to improve engagement between the Murray CMA, primary school students and various other partners. The initiative provides opportunities for positive, authentic and co-operative ventures that encourage students in the catchment to develop clever and creative solutions to Natural resource management issues and planning across the Murray catchment.

[www.murray.cma.nsw.gov.au/creative-catchment-kids.html](http://www.murray.cma.nsw.gov.au/creative-catchment-kids.html)





## MURRAY CATCHMENT MANAGEMENT AUTHORITY

# CORROBOREE FROGS

Factsheet B11-Aug-2011



Northern Corroboree Frog © Dave Hunter



Southern Corroboree Frog © Dave Hunter

**Northern and Southern Corroboree Frogs are two of Australia's most iconic frog species, but they are also two of Australia's most endangered.**

### What are they?

There are two closely related species of Corroboree Frog: the Southern Corroboree Frog (*Pseudophryne corroboree*), and the Northern Corroboree Frog (*Pseudophryne pengilleyi*). Both species are between 2.5 and 3 centimetres in length.

### Where are they found?

Corroboree Frogs are only found in a small area of south-eastern New South Wales. The Southern Corroboree Frog only occurs in Kosciuszko National Park at altitudes between 1300 and 1700 metres. The Northern Corroboree Frog occurs in Northern Kosciuszko National Park, Namadgi National Park, Brindabella National Park and some adjacent state forests above 750 metres altitude.

### Life cycle of the Corroboree Frogs

Corroboree Frogs breed in high altitude bogs and swamps. The males call during summer from nests in thick vegetation at the edges of pools and seepages. Female Corroboree Frogs are attracted to these calls and lay their eggs in the nests. The eggs develop and hatch when sufficient rain falls in autumn and winter; the rain floods the nest sites and stimulates the tadpoles to hatch. Once hatched, the tadpoles move through the vegetation into a main pool where they metamorphose by the following summer. It then takes four years for the frogs to reach sexual maturity and repeat the life-cycle.

### Conservation Status

Both Corroboree Frog species have been in a rapid state of decline since the mid 1980s. The Southern Corroboree Frog has now declined in more than 98% of its former range, and is likely to become extinct in the wild without human intervention. The Southern Corroboree Frog is listed as critically endangered at both a state and national level. Latest surveys indicated that less than 50 Southern Corroboree Frogs are left in the wild.

The Northern Corroboree Frog has also undergone substantial declines across its range. The decline of this species has been particularly severe in the Brindabella Ranges, where it has become almost entirely extinct from the Australian Capital Territory. The species is listed as critically endangered at both the state and national level.

### Why are populations in decline?

The decline of Corroboree Frogs, and many other frog species throughout Australia, is due to a disease known as chytridomycosis, which is caused by infection with the Amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*). Amphibian Chytrid Fungus is a recent introduction to Australia, which is why many of Australia's frog species have limited resistance to this pathogen. This pathogen is believed to have originated from South Africa, and is likely to have been introduced into Australia on the African Clawed Frog, which was imported by pharmaceutical companies between the 1930s and 1960s.



Catchment Management  
Authority  
Murray



CARING  
FOR  
OUR  
COUNTRY



**Images**

1. Belly of a Southern Corroboree Frog © Dave Hunter
2. Young Corroboree Frogs © Murray CMA
3. Montane peatlands — habitat of the Corroboree Frog © Dave Hunter

**Why should we save Corroboree Frogs?**

Corroboree Frogs are considered an iconic Australian species, and are an important component of our natural heritage. Given their uniqueness and inherent value to our nation, it would be a tragedy if Corroboree Frogs became extinct and future generations were deprived of experiencing these remarkable creatures. Saving the Corroboree Frogs will also represent a major achievement for the conservation of amphibians globally. Worldwide, amphibians have declined and become extinct at a greater rate over the past 50 years than birds, reptiles or mammals. Australia alone has seen the extinction of six frog species in recent decades, with the Southern Corroboree Frog predicted to be the ninth if intervention does not occur.

**Can we save the Corroboree Frogs?**

Saving the Corroboree Frogs will require helping them to develop resistance to the Amphibian Chytrid Fungus. This aim will be best achieved by maintaining Corroboree Frog populations in the wild through a captive breeding and reintroduction program. This process will allow the development of resistance to the Amphibian Chytrid Fungus through continued exposure to this pathogen under natural conditions.

**Captive Breeding**

A program is currently breeding Corroboree frogs in captivity across Australia and re-introducing healthy frogs, free of the deadly fungus, into the wild.

Captive breeding of Corroboree Frogs takes place in Taronga Zoo, Tidbinbilla Nature Reserve (ACT), Healesville Sanctuary, Melbourne Zoo and the Amphibian Research Centre in Melbourne. The captive breeding program has successfully bred Corroboree frogs for a number of years and frogs, tadpoles and eggs are being reintroduced into habitat in Kosciuszko National Park.

**Additional information**

Visit the Corroboree Frog Website: [corroboreefrog.org.au](http://corroboreefrog.org.au) for more information on Corroboree Frogs and how you can help in their recovery.



**Murray CMA Offices:**

Deniliquin (Head Office)	03 5880 1400
Tumbarumba	02 6948 9124
Albury	02 6051 2200

[www.murray.cma.nsw.gov.au](http://www.murray.cma.nsw.gov.au)





# A whole lot of life

Everywhere on our planet there is life. From the polar-ice caps and deepest oceans to the highest mountain peaks, life has found a way to exist. In fact, on Earth, there are so many different living things that we are yet to discover and identify them all.

In the natural world, species depend on each other to survive. The relationship between the soil, water, plants, animals, insects, decomposers and bacteria is what makes a habitat healthy. All of these contribute towards biodiversity.

A flowering plant would not survive if it could not feed on the nutrients in the soil that were provided by decomposers breaking down waste, or if its flowers were not pollinated by insects, birds and other animals. Animals would not survive if there were no plants or other animals to feed on, and their numbers would get out of control if there were no natural predators preying on them.

Having a healthy, biodiverse ecosystem is incredibly important to the whole planet's well-being. Protecting the Corroboree Frog population is extremely important to preserve the biodiversity in the Murray Catchment.

## How does biodiversity help the environment?

- Habitat is provided by trees, bushes, grasses, rivers or anything that provides food, shelter, and water for all the species that live in an area (including birds, insects, fungi, micro-organisms and other animals and plants).
- Plants (living and dead) provide food for other species.
- Pollinators like insects, birds, bats and other animals make sure that plants can be fertile and spread their seed.
- Predators and parasites help to control the populations of their prey or hosts.
- Green plants use the carbon dioxide from the air and produce oxygen. Forests and woodlands replenish the oxygen in the air and help reduce climate change.
- Decomposers (such as earthworms, bacteria and fungi) break down organic matter (plants and animals that have died) and recycle the nutrients back into the soil. Without these nutrients plants would not be very healthy.
- Wetlands and other habitats help to control the effects of floods and also filter pollution from the environment.

**Biodiversity** (*biological diversity*) is a term that is used to describe the variety of living things on Earth. The biodiversity of our planet encompasses all life from the smallest microorganism to the largest mammal.

There are considered to be three basic levels of biodiversity:

- The number and kinds of species.
- The Earth's ecosystems (habitats); its savannas, rainforests, oceans, forests, plains, marshes, deserts and all the other environments.
- The genetic diversity; all the different genetic variations between species.

# Species and communities under threat

## Ecological communities

Our natural environment is made up of plants, animals and the land on which they live. Together they are called an “ecological community”. All the plants and animals within a community rely on each other for food, shelter and reproduction.

Ecological communities can change depending on the climate, soil type, the availability of water and their location in the landscape, such as on a hill or out in a floodplain. Some examples include woodlands, grasslands, shrublands, forests, wetlands, ground springs and cave communities.

## Under threat

The area that these communities occupy in the landscape can often come under threat. These threats can include the clearing of native vegetation, impacts from weeds and feral animals and overgrazing. A major threat to our ecological communities is the loss of native ground plants like grasses and lilies.

When these threats become so great that the community may no longer exist, they are then protected by law through the national *Environment Protection and Biodiversity Conservation Act (1999)*.

This protection is extremely important for those communities that are not located within national parks or other conservation areas. The aim is to support the long-term survival of the community, prevent further decline and help in their recovery through landholder and community support.

**Communities under threat are known as threatened ecological communities.**

## Classifying threats

Plants, animals and ecological communities can be classified under different levels of threat. A threatened species or community can be listed under legislation (either at the state or commonwealth level) as any of the following classifications.

Vulnerable species	A species numbers have been dropping significantly but it is not yet endangered.
Endangered species	A species numbers are so low that it is close to becoming extinct.
Critically Endangered Species:	A species numbers are so low that it is very close to becoming extinct.
Extinct in the wild	There are no more of a species left in their native habitats but there are some in captivity. A species numbers are so low that it is close to becoming extinct.
Extinct	There are no more of a species left anywhere in the world.

**The Southern Corroboree Frog is listed as an critically endangered species under both state and national legislation. If it is not protected it will become extinct in the wild.**

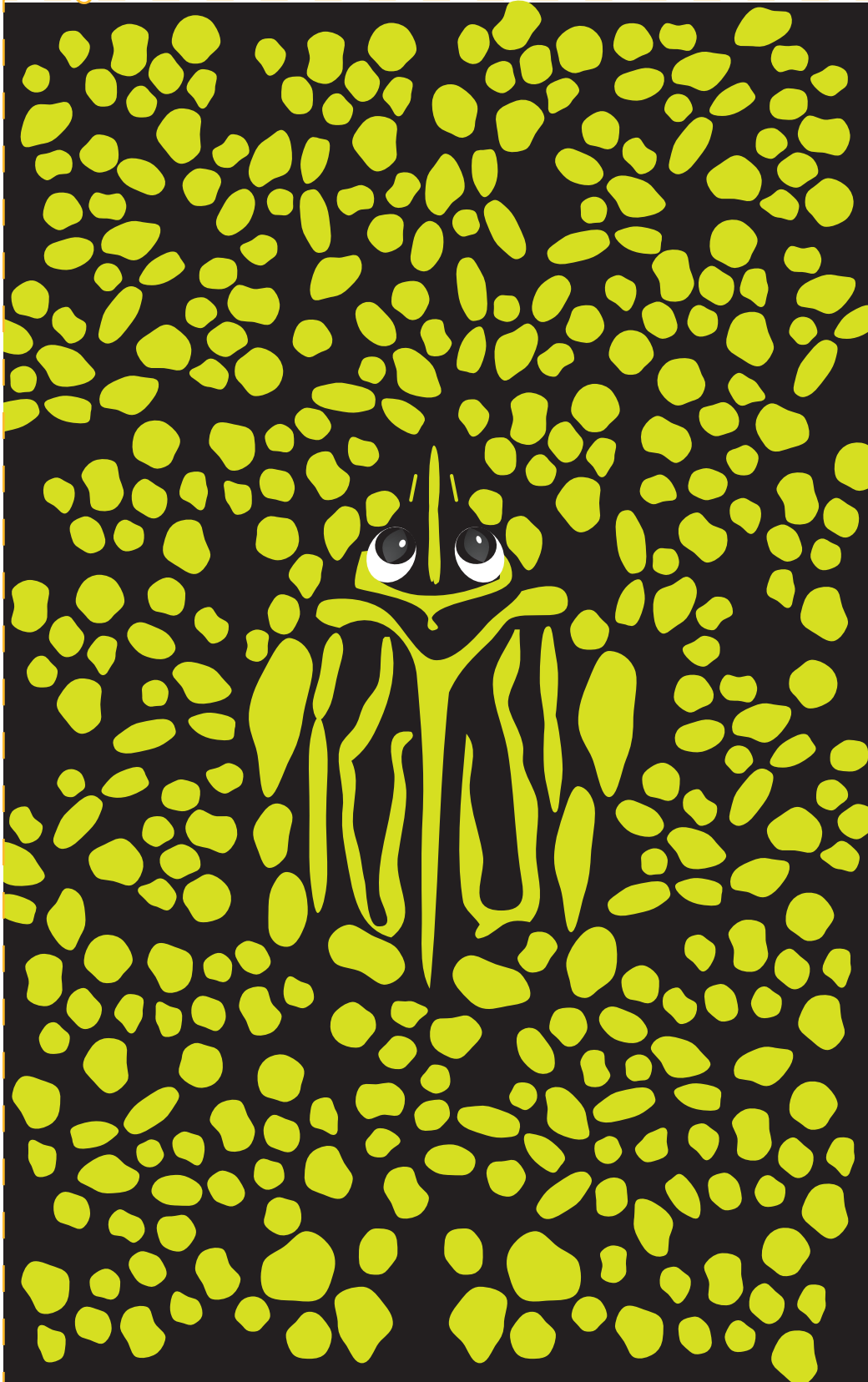


Australian Government

Department of Sustainability, Environment,  
Water, Population and Communities

NORTHERN CORROBOREE

# FROG







Australian Government

Department of Sustainability, Environment,  
Water, Population and Communities

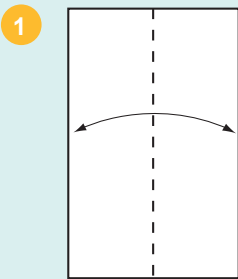
# NORTHERN CORROBOREE FROG



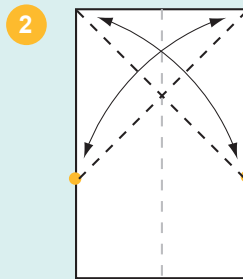
DSEWPaC and Michelle McAulay



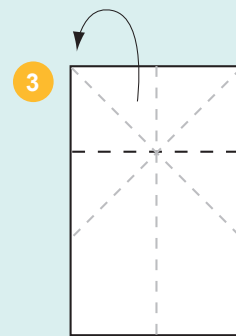
The **northern corroboree frog** is nationally threatened and occurs in a small number of high-altitude waterlogged grasslands, heath, sphagnum moss bogs and adjacent woodlands.



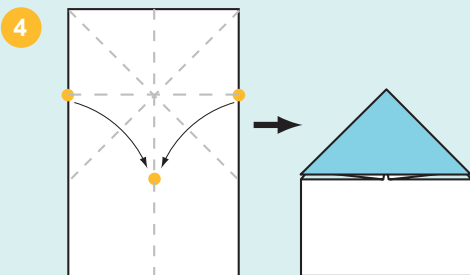
1 Start with a rectangular sheet of paper, white side up and the frog's eyes looking upward. Fold it in half, and open out again.



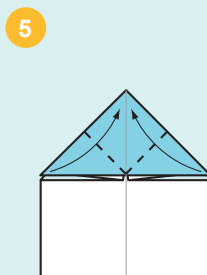
2 Fold both top corners to the opposite edge of the paper. Your creases should look like this.



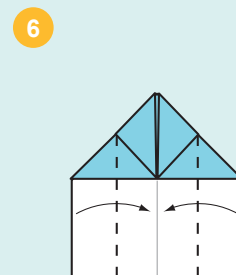
3 Where the diagonal creases meet in the middle, fold the paper backwards, crease well and open.



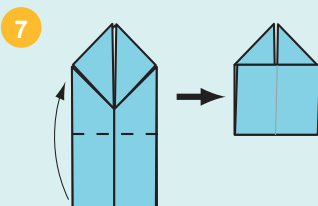
4 Hold the paper at the sides, bring these points down to the centre line, then flatten. The creases should do most of the work here!



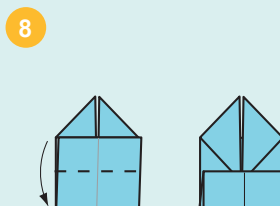
5 Fold the uppermost triangles up to the top point.



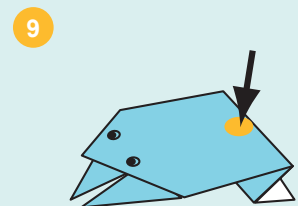
6 Fold sides in to the centre line.



7 Fold bottom of model upwards so the end sits in the centre of the top diamond.



8 Now fold the same part downwards, in half.



9 Turn over and your frog is finished! To make him jump, press down on his back as shown.

# Stage 2 - Corroboree Frog education

## Curriculum outcomes

This education kit has been designed to raise awareness of the Corroboree Frog by providing activities that have been aligned to the Stage 2 NSW Syllabus and Australian Curriculum outcomes (table). These activities also relate to the following Organising Ideas under the Australian Curriculum cross-curriculum priorities in sustainability:

- OI.2 All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival.
- OI.9 Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.

Activities	NSW Syllabus	Australian Curriculum
<b>Activity 2.1:</b> A Venn diagram is used to help students determine similarities and differences between 2 living and 1 non-living thing. Students should determine what it means for something to be living: does it drink, eat, grow, move, reproduce, breathe or respond to stimuli.	ST2-10LW	ACSSU044
<b>Activity 2.2:</b> Students are asked to sort living and non-living things. They must identify any once living or product of living things. Students provide three of their own examples of each living, non-living, once living and products of living things.	ST2-10LW	ACSSU044
<b>Activity 2.3:</b> Using a simple dichotomous key students classify a list of things. As an extension they can design their own key to classify objects.	ST2-10LW	ACSSU044
<b>Activity 2.4:</b> Students will learn about Corroboree Frogs by reading Fact Sheet 1 (provided at beginning of kit) and answer 18 questions. Individuals, small groups or class groups can complete this quiz.	ST2-11LW	ACSSU073
<b>Activity 2.5:</b> Students read the story about Stripes and the Corroboree Frog life cycle. They will translate the story creating a Corroboree Frog life cycle, including timeframes and conditions that trigger certain events.	ST2-10LW	ACSSU072
<b>Activity 2.6:</b> Students compare their Corroboree Frog life cycle created in Activity 2.5 to the animal and plant life cycle provided. Similarities and differences should be noted in the spaces provided.	ST2-10LW	ACSSU072

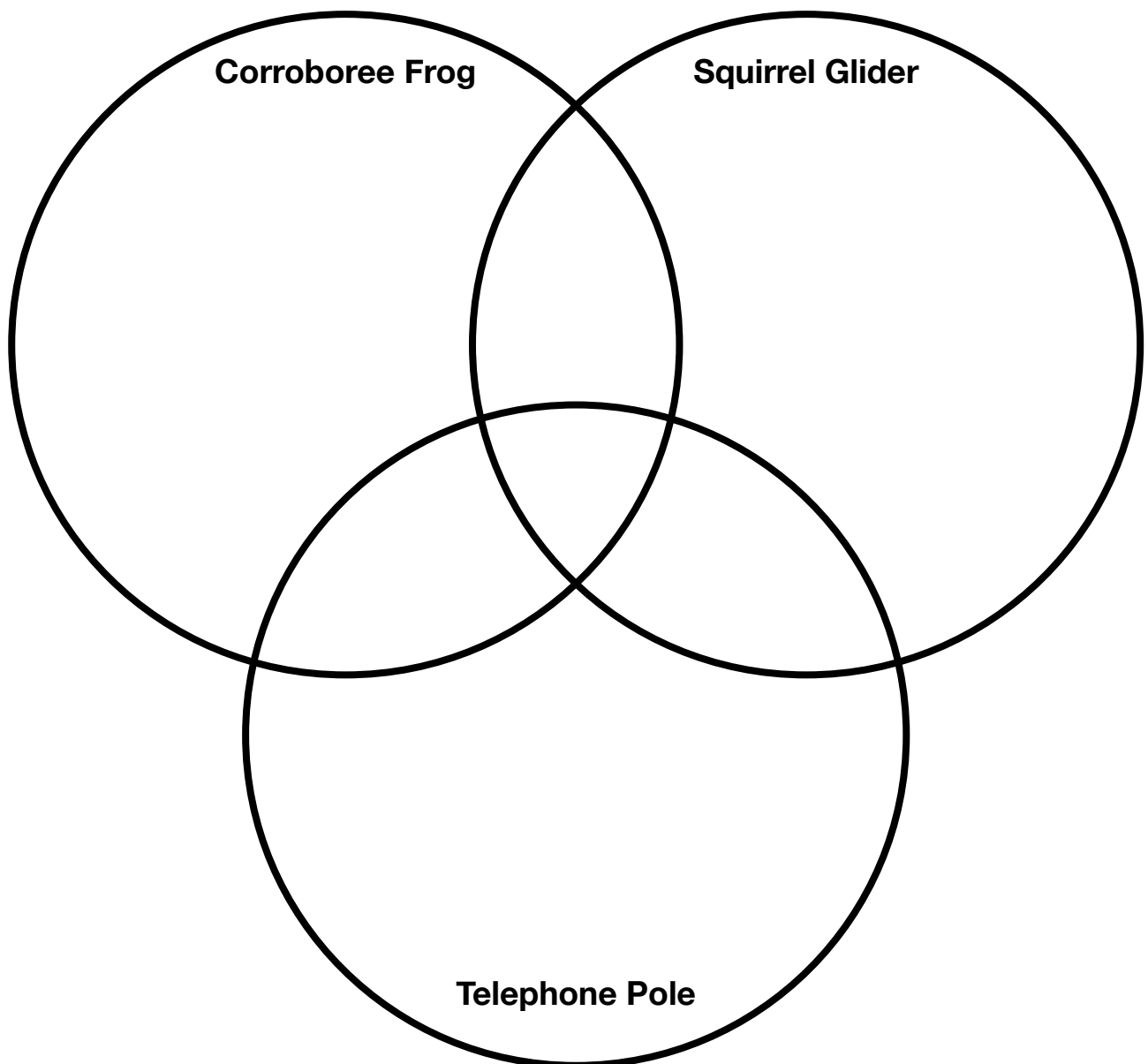
# What it means to be living

## Do you know what it means to be living?

Venn diagrams are a way we can group similar properties together.

Write some words describing attributes of the things in each of the three circles.

To help you, think about the following attributes: what is its shape, size and purpose; does it drink, eat, grow, colour, reproduce, breathe or respond to stimuli; where it is found and what it is made of.





# What it means to be living

1. Are there any similar properties in the overlapping areas between the Corroboree Frog, Squirrel Glider and Telephone.

	Shared Attributes
<b>Corroboree Frog &amp; Telephone Pole</b>	
<b>Squirrel Glider &amp; Telephone Pole</b>	
<b>Corroboree Frog &amp; Squirrel Glider</b>	
<b>All three</b>	

2. Which two of these things had the most in common? Why do you think this is the case?

3. List what you think are some of the features of a living thing.

# Living versus non-living

We use, see, touch, hear, smell and even taste a large number of **living** and **non-living** things everyday. A living thing can be defined as something that is able to breathe, eat, drink, move, grow and reproduce.

- Sort the following list into living and non-living things into the table below.

Carpet python, telephone pole, Corroboree Frog, woollen jumper, fishing rod, cow pat, Blue-tongued lizard, TV antenna, Kookaburra, wooden chair, you, brick, Pelican and beef steak.

Living things	Non-living things

- Are there any things on the list that you think were once living or a product of a living thing?

Once Living	Product of a living thing

# Living versus non-living

3. Can you give three of your own examples for the following.

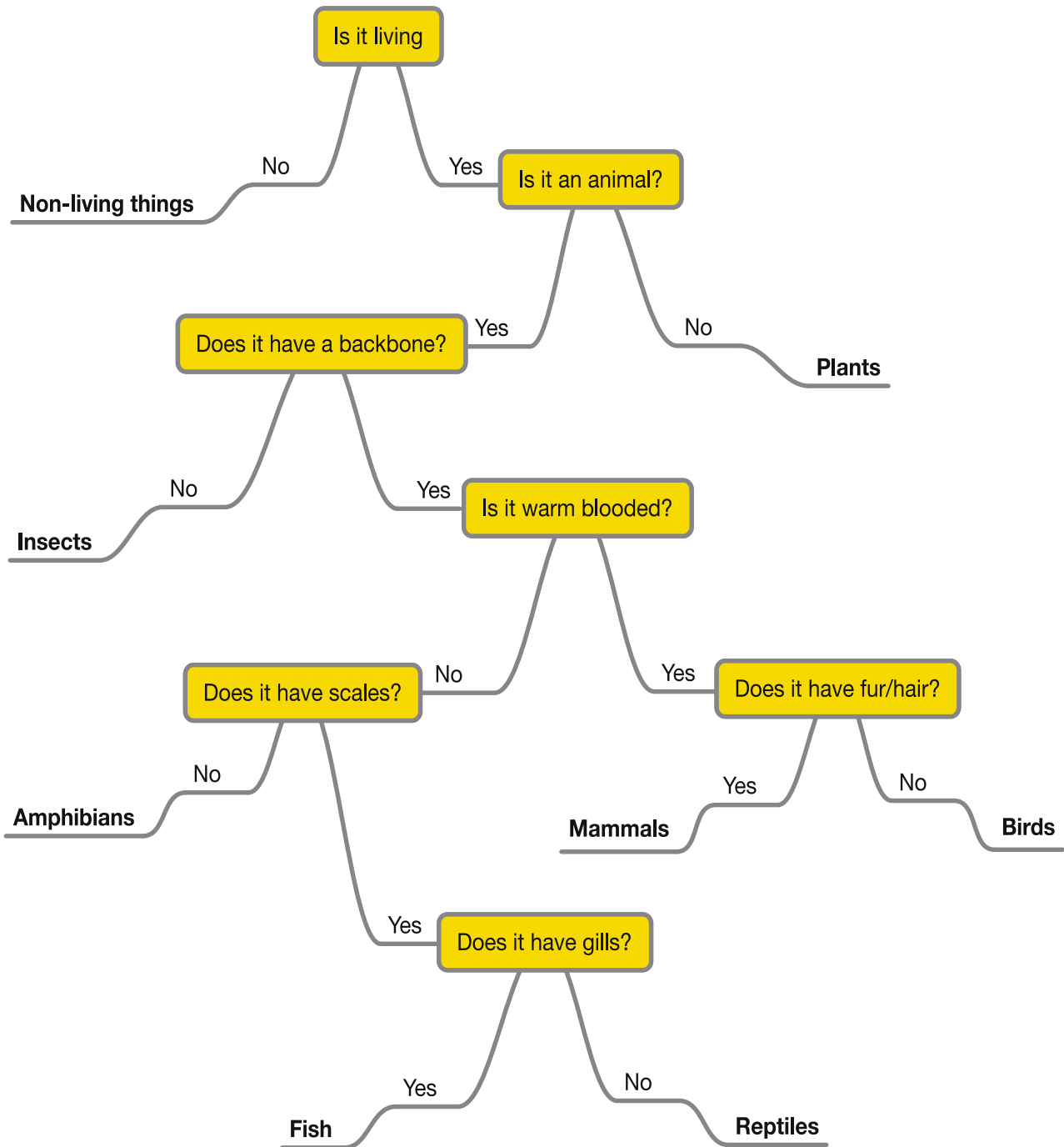
	Examples
<b>Living</b>	1. 2. 3.
<b>Non-living</b>	1. 2. 3.
<b>Once living</b>	1. 2. 3.
<b>Product of a living thing</b>	1. 2. 3.



# Classifying living things

**Dichotomous keys** (pronounced *die-cot-o-mus*) are a tool that scientists can use to classify different things. Each stage presents a question or choice that you must answer. If you follow these choices through until the end you can correctly classify something.

Below is an example of a simple dichotomous key. See if you can classify yourself using the key.



# Classifying living things

Using the dichotomous key, classify the following things. Write down each of the choices you make along the way and what the thing is classified as. An example has been provided for you in the table.

<b>Carpet Python</b>	<b>Squirrel Glider</b>	<b>Corroboree Frog</b>	<b>Gum Tree</b>	<b>Murray Cod</b>	<b>Computer</b>	<b>Cockatoo</b>
Living						
Animal						
Backbone						
Cold blooded						
Scales						
No Gills						
<b>Reptile</b>						

## Extension

Use your new found knowledge to create a dichotomous key of your own in your workbook. You first have to decide what you are trying to classify and make up a series of yes/no questions that helps you move towards the final answer.

# What you know about the Corroboree Frog

Use fact sheet 1 to answer the following questions. (Murray Catchment Management Authority - Corroboree Frogs)

1. How many different Corroboree Frog types are there?

.....

2. Name the Corroboree Frogs.

.....

.....

3. What are the two main colours of Corroboree Frogs?

.....

.....

4. Which Corroboree Frog is found in the Northern Kosciuszko National Park, Namadgi National Park and Brindabella National Park?

.....

5. Where is the Southern Corroboree Frog found?

.....

.....

6. Where do the Corroboree Frogs breed?

.....

.....

.....

7. Which frog makes the calls to attract the other sex to the nest?

Male

Female

8. What event triggers the eggs to hatch into tadpoles?

.....

.....

9. How long does it take the Corroboree Frog to reach sexual maturity?

4 months

4 years

10. What has been happening to Corroboree Frogs since the mid 1980's?

.....

.....

.....

11. How much of the Southern



# What you know about the Corroboree Frog

Corroboree Frog's former range are they now found in? (Hint: it is not 98%)

.....

12. What is the conservation status that the Southern Corroboree Frog is listed at?

- Vulnerable
- Endangered
- Extinct in the wild

13. How many Southern Corroboree Frogs do they think are left in the wild?

.....

14. Has the Northern Corroboree Frog population been increasing or decreasing?

.....

15. What is the name of the disease affecting the frogs and where did it come from?

.....

.....

16. How can we save Corroboree Frogs?

.....

.....

.....

17. Where are some of the places that there are captive breeding programs for Corroboree Frogs?

.....

.....

.....

.....

18. Why should we bother to save Corroboree Frogs?

.....

.....

.....

.....

# Corroboree Frog life cycle

## Story - Stripes the Corroboree Frog

Once upon a time, living in Kosciuszko National Park in the Snowy Mountains, there was a frog named Stripes. Stripes was very special because she was a critically endangered Corroboree Frog. The numbers of Corroboree Frogs had dropped extremely low due to an introduced fungal disease (chytridomycosis), introduced pests and other human activities in the National Park.

Stripes was lonely! She wandered around the high altitude bogs and swamps searching for other Corroboree Frogs. She longed to find others of her species but they were getting harder and harder to find.

Stripes knew that now she was four years old and had reached full maturity she had a responsibility to find a mate and breed. Stripes wanted to help the Corroboree Frog population by laying as many eggs as possible. If she could help the frog numbers, she thought that one day there may again be Corroboree Frogs spread throughout the highlands.

Onward and onward Stripes hopped, swam, crawled and walked searching for a sign of her own kind. She would often stop and be very still, straining her ears to hear the call of another Corroboree Frog.

One summer day, when she had climbed high into the mountains, she collapsed on the edge of a swamp and cried out as loud as she could (in frog language of course)

“I am soooooo lonely! Am I ever going to meet another Corroboree Frog?”

And then faintly in the distance is started. “Rrrrrriiibbbiit! Rrrriibbit! Rrribit! Ribit!”

She stood silently and listened. The call continued. It was a male frog calling out to females who wanted to be his mate. Stripes quickly hopped towards the sound, pausing every so often to focus on where it was coming from.

“Rrrrrriiibbbiit! Rrrriibbit! Rrribit! Ribit!” (I’m a good looking fella frog come see my beautiful nest)

“Oh please keep calling. I am trying to find you.”

# Corroboree Frog life cycle

Eventually, resting amongst the boggy heathland on the edge of a mossy pool, was a beautiful moist nest with a male Corroboree Frog croaking proudly. He stopped when he saw Stripes.

“Ahhh! You are breath taking. My name is Tiger. Please come and join me in my nest.”

Tiger explained to Stripes that he had just arrived in these parts. He had actually been bred by humans at a place called Taronga Zoo and released back into the wild. He told her that there were several human places like this that were all working to help Corroboree Frog populations increase in the wild.

Stripes was intrigued by this rugged stranger and was happy to help the population by laying her eggs in his nest. Tiger fertilised the eggs for her and then they waited.

The months passed and Stripes and Tiger patiently waited for the rains to come and their eggs to hatch. Inside the eggs the Corroboree Tadpoles developed and grew stronger.

At the start of winter the rains finally came. These rains were big enough to stimulate the tadpoles in the eggs. Stripes noticed her eggs moving and out broke some tiny little tadpoles. The tadpoles squirmed through the vegetation of the nest and slipped into the main pool.

Over the next six months Stripes watched her tadpoles grow and get stronger. They slowly developed going through a frog metamorphosis. They grew buds on their sides that eventually developed into legs. Stripes thought her offspring looked very amusing and awkward as their new body parts grew.

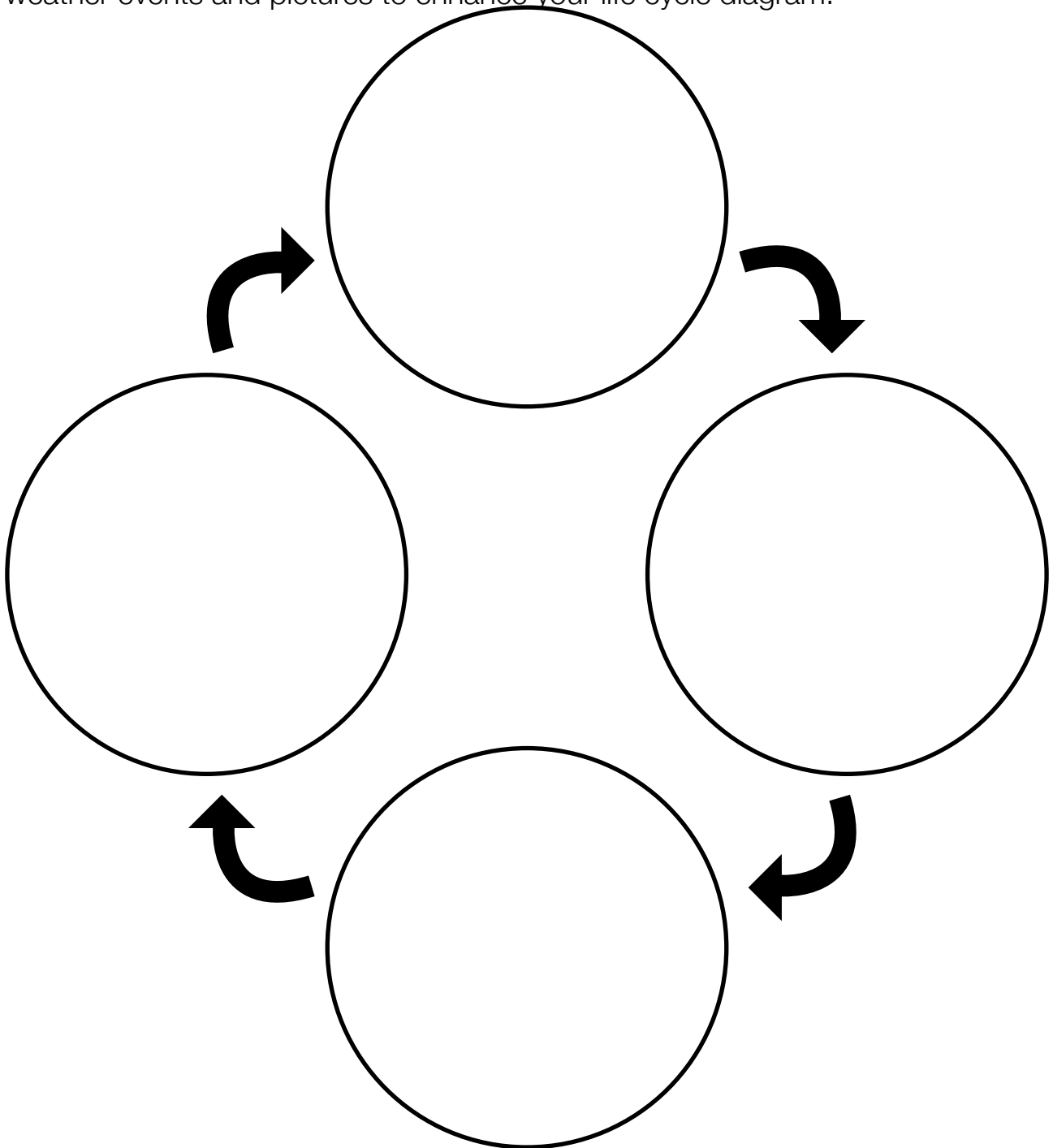
Eventually just as summer arrived the tadpoles dropped their tails and finally turned into proper little Corroboree Frogs. They hopped away and went out to experience their own lives. Stripes was extremely happy that she had helped the Corroboree Frog population and was looking forward to the next breeding season when she would be able to lay more eggs.

Stripes' proudest moment came four years later when some of those first batch of offspring had reached sexual maturity. She smiled to herself as she observed them crawling through the highlands searching for suitable mates.

# Corroboree Frog life cycle

An animal life cycle shows how it progresses through different stages of development. Frogs have very interesting life cycles as they go through a process called **metamorphosis**.

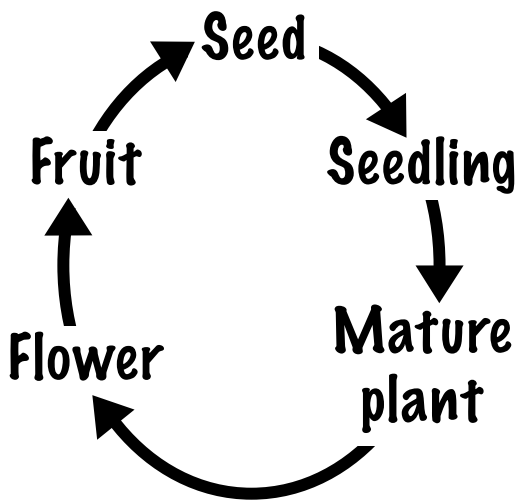
Read the story about “Stripes the Corroboree Frog” and see whether you can make a life cycle diagram below for the Corroboree Frog. Include time lines, weather events and pictures to enhance your life cycle diagram.



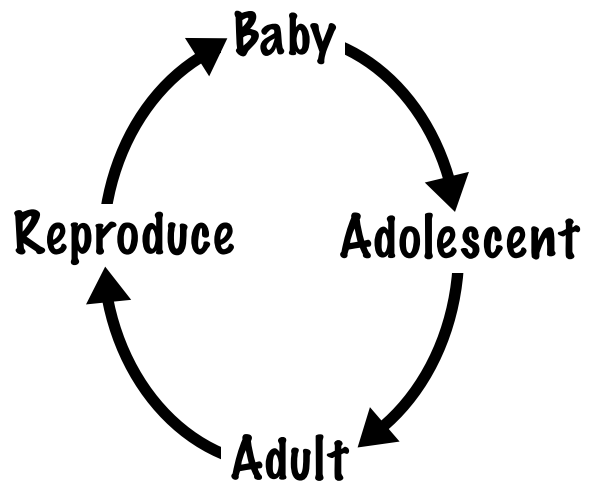
# Comparing life cycles

Below is an example of a life cycle for a plant and a mammal. Compare the life cycles that you made up for a Corroboree Frog in Activity 2.5 with the plant and mammal life cycles. List any differences or similarities between the three life cycles.

**Simple plant life cycle**



**Simple mammal life cycle**



Plant	Mammal	Corroboree Frog
<b>Differences</b>		
<b>Similarities</b>		

# Stage 3 - Corroboree Frog education

## Curriculum outcomes

This education kit has been designed to raise awareness of the Corroboree Frog by providing activities that have been aligned to the Stage 3 NSW Syllabus and Australian Curriculum outcomes (table). These activities also relate to the following Organising Ideas under the Australian Curriculum cross-curriculum priorities in sustainability:

- OI.2 All life forms, including human life, are connected through ecosystems on which they depend for their wellbeing and survival.
- OI.9 Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.

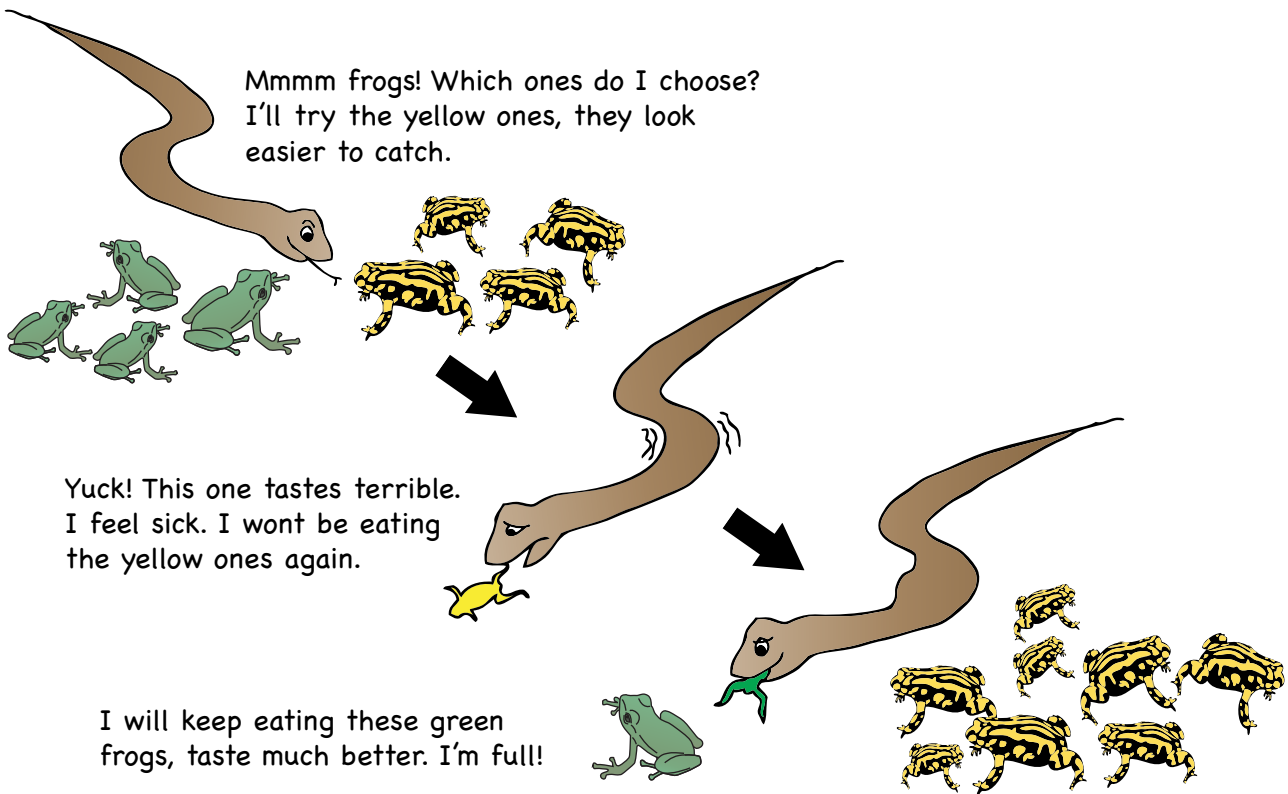
Activities	NSW Syllabus	Australian Curriculum
<b>Activity 3.1:</b> A short description and diagram explains Natural Selection. Students are required to explain what is happening in the picture and gain an understanding of natural selection.	ST3-10LW	ACSSU043
<b>Activity 3.2:</b> Structural adaptations of frogs are provided on a fact sheet. Students are required to label a frog diagram and answer questions relating to the fact sheet.	ST3-10LW	ACSSU043
<b>Activity 3.3:</b> Students are introduced to adaptations specific to the Corroboree Frog. They are asked to identify the advantages and disadvantages of the different adaptations.	ST3-10LW	ACSSU043
<b>Activity 3.4:</b> Students are asked to research the Corroboree Frog habitat and describe their food, water, shelter, preferred climatic conditions and places they like to visit.	ST3-11LW	ACSSU094
<b>Activity 3.5:</b> Using a range of provided websites students are asked to create a poster to display the extreme environment that makes up the Corroboree Frog habitat.	ST3-11LW	ACSSU094
<b>Activity 3.6:</b> After watching a range of video's students are asked to answer questions about the Corroboree Frogs plight and the effort to captive breed and release frogs into the wild.	ST3-10LW ST3-11LW	ACSSU043 ACSSU094



# Natural selection

Natural selection is an important part of the theory of evolution. It means that as every living thing develops with slight variations, the stronger species, or one with the most successful adaptations, have a greater chance of survival. These traits that have helped them survive are then passed down to future generations shaping the overall development of the species.

Over time the Corroboree Frog evolved developing toxins in their skin and bright colour to warn off predators.



In your own words describe what has happened in the picture in the Corroboree Frogs development during Natural Selection. Why did they all develop to be have the bright yellow colour.

# Frog structural adaptations

## The tympanum/ear

Frogs can hear very well using big round ears on the side of their head. Their ears are called tympanum, which means drum, because they have a membrane over the top of them that protects them in the water and acts like a drum to pick up sounds. Frogs can detect extremely high-pitched sounds with their ears and low-pitched sounds through their skin.

## The tongue

Frogs have sticky tongues that, unlike humans, are attached to the front of their mouths. This allows them to throw their tongues out of their mouths to stick to insects. The tongue then retracts pulling its prey back into their mouths.

## Eyes

Frogs hunt on land by using their vision. They have very good eyesight that is based on movement. They can only see food or avoid predators if they see them moving. Frogs are able to make their eyes bulge out to be able to see as many directions at once as possible.

Frogs often blink while they are eating. They swallow things whole and push their eyes into their sockets which helps push food down their throats.

## Legs

Frogs have very powerful legs that can allow them to make huge jumps considering their size. They use coiled tendons like in an archers bow to jump long distances. Before jumping, the leg muscle shortens, loading energy into the tendon, which then recoils like a spring to propel the frog along.

## Skin

A frog's skin is a very important organ. They absorb almost all of their water through the skin and some of their oxygen. They must keep their skin moist for these processes to work. If a frog's skin becomes too dry they have trouble absorbing oxygen and releasing carbon dioxide. If they are dry for too long, they will suffocate and die.

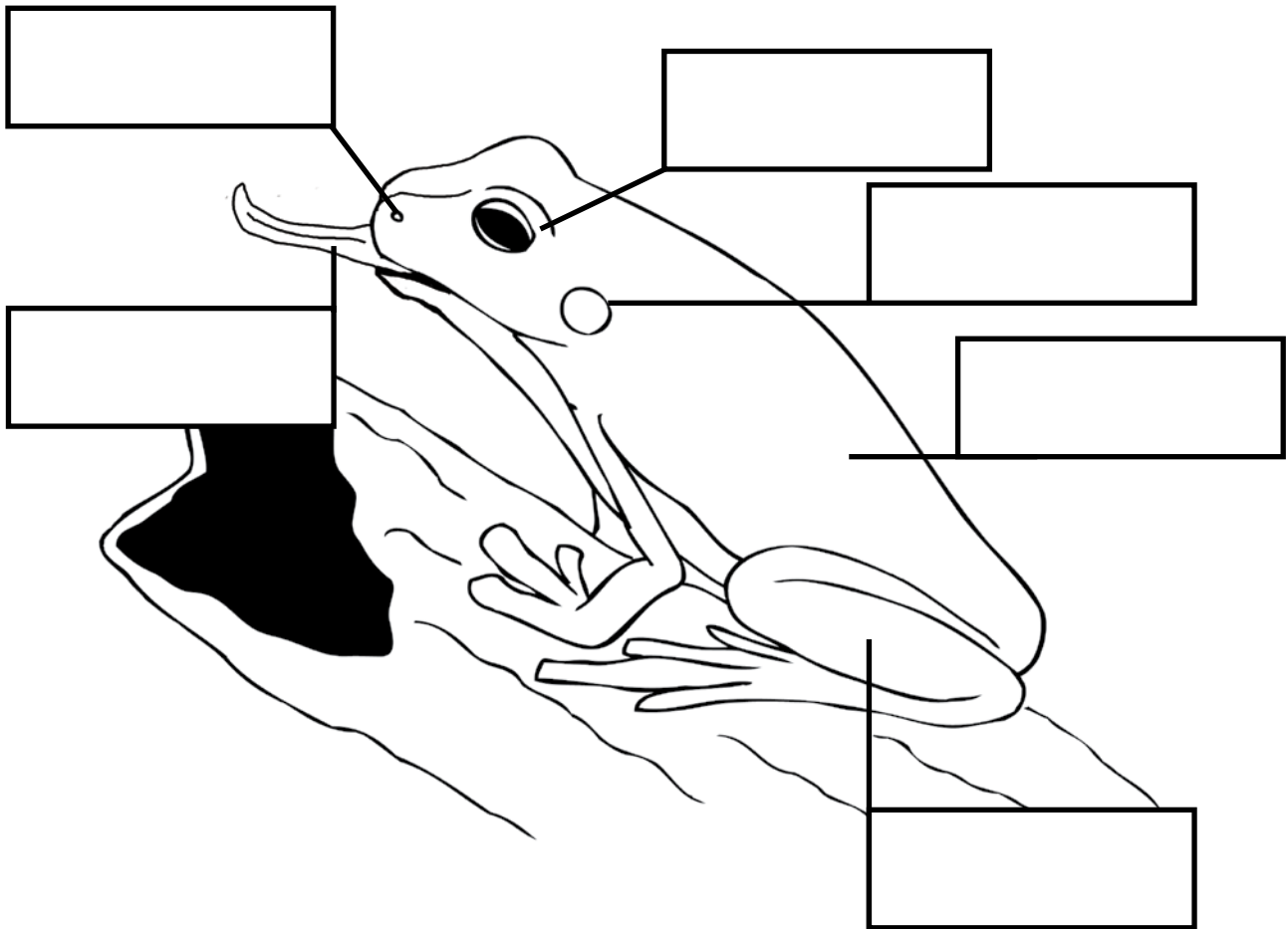
## Smell

Frogs usually breathe through their nostrils with their mouths shut. They use their sense of smell predominantly during breeding rather than to find food.

Most frogs use sensitive areas around their eyes and on their skin to detect chemical changes in the air given off by predators or food.

# Frog structural adaptations

1. Use the fact sheet to fill in the blanks on the frog diagram.



2. How do frogs breathe when they are underwater?

.....

3. What is another name for a frogs ear?

.....

4. What do frogs use to detect their food?

.....

5. Are frog and human tongues similar? Why/ Why not?

.....

6. How are frogs able to leap for long distances?

.....

7. Why do frogs blink when they swallow?

.....

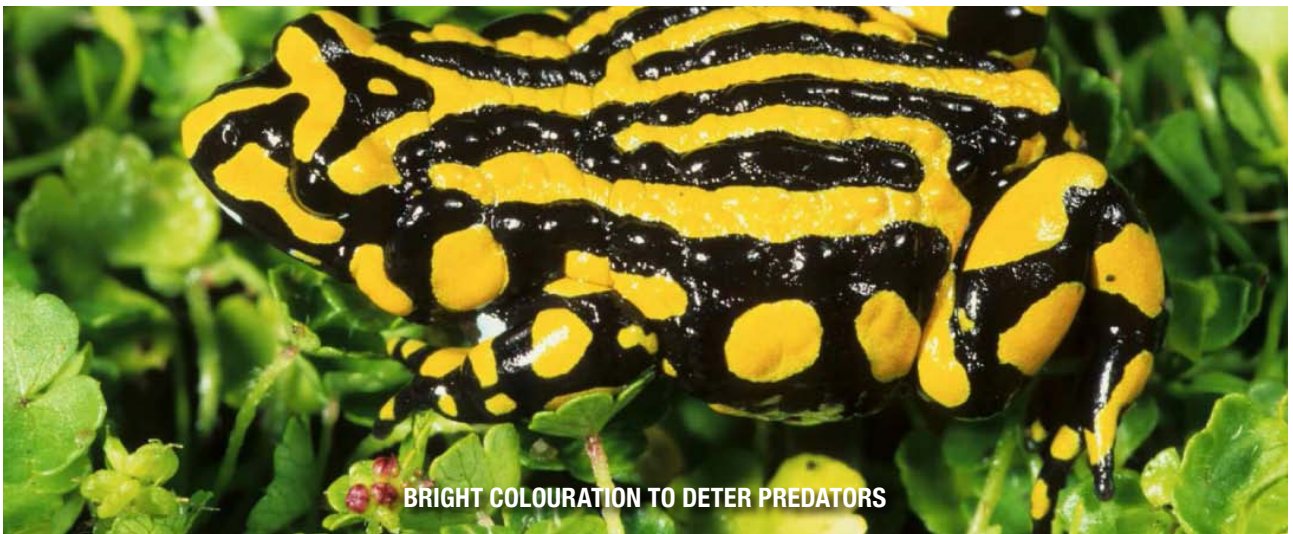
# Corroboree Frog adaptations



**TOES ARE NOT WEBBED - THEY WALK**



**THEY ARE VERY SMALL - 2.5 TO 3 CM**



**BRIGHT COLOURATION TO DETER PREDATORS**



**LIVE ONLY IN ALPINE AREAS**



**FEMALES LAY 10-40 EGGS PER YEAR**

# Corroboree Frog adaptations

1. Adaptations identify features or characteristics that animals or plants develop to help them survive. These are developed over long periods of time by gradual changes that occur. List 3 of the 5 adaptations from the photo sheet.

.....  
.....  
.....

2. Both the Southern and Northern Corroboree Frogs are very small being only 2.5-3 cm in length. Can you think of any advantages to them being so small?

.....  
.....

3. The yellow and black stripes are a striking adaptation of the Corroboree Frog. Their skin is not only colourful but the frogs also produce toxins that make it poisonous. Can you think of the advantages of their skin adaptations that help the Corroboree Frogs survive?

.....  
.....

4. What is different about the Corroboree Frogs feet compared to some other types of frogs? Why is this?

.....  
.....  
.....  
.....

5. The Corroboree Frog lays up to 40 eggs at a time. Do you think this sounds like a lot?

YES       NO

6. Most other frogs and toads lay hundreds to thousands of eggs at a time. The cane toad which is an invasive pest in much of northern Australia, can lay up to 70,000 eggs per year. Would you classify the fact that Corroboree Frogs only lay 40 eggs at a time a successful adaptation? Why/ Why not?

.....  
.....  
.....

7. The Corroboree Frogs only live and breed in alpine environments above 1300 metres above sea level. This adaptation has both advantages and disadvantages. List as many of these as you can think of.

Advantages

.....  
.....  
.....

Disadvantages

.....  
.....  
.....



# Corroboree Frog adaptations

## Teachers Answers

1. List 3 of the 5 adaptations from the photo sheet.

- Toes are not webbed - they walk
- They are very small
- Bright colouration to deter predators
- Live only in alpine areas
- Females lay 10-14 eggs per year

2. Can you think of any advantages to them being so small?

**Less food, water shelter needed, less energy spent, can hide easily, can live in smaller places needing smaller alpine ponds to survive.**

3. Can you think of the advantages of their skin adaptations that help the Corroboree Frogs survive?

**Bright colours can be a warning to predators that they are not good to eat. The broken outline caused by the stripes can help them be camouflaged and blend in with their habitat. The poisonous skin helps deter predators.**

4. What is different about the Corroboree Frogs feet compared to some other types of frogs? Why is this?

**They are not webbed. This allows them to walk around the mossy, boggy heathlands in their alpine environment.**

5. The Corroboree Frog lays up to 40 eggs at a time. Do you think this sounds like a lot?

YES       NO

6. Would you classify the fact that Corroboree Frogs only lay 40 eggs at a time a successful adaptation? Why/ Why not?

**This is not a very successful adaptation as if the Corroboree Frogs laid more eggs then there would be a better chance of them flourishing and more frogs surviving. Possibly, they would not be critically endangered if more could survive.**

7. The Corroboree Frogs only live and breed in alpine environments above 1300 metres above sea level. This adaptation has both advantages and disadvantages. List as many of these as you can think of.

**Advantages: The cool alpine climate limits the amount of other species that live in the area and reduces competition for food, water and shelter. The cool alpine climate limit the amount of predators, especially other reptiles.**

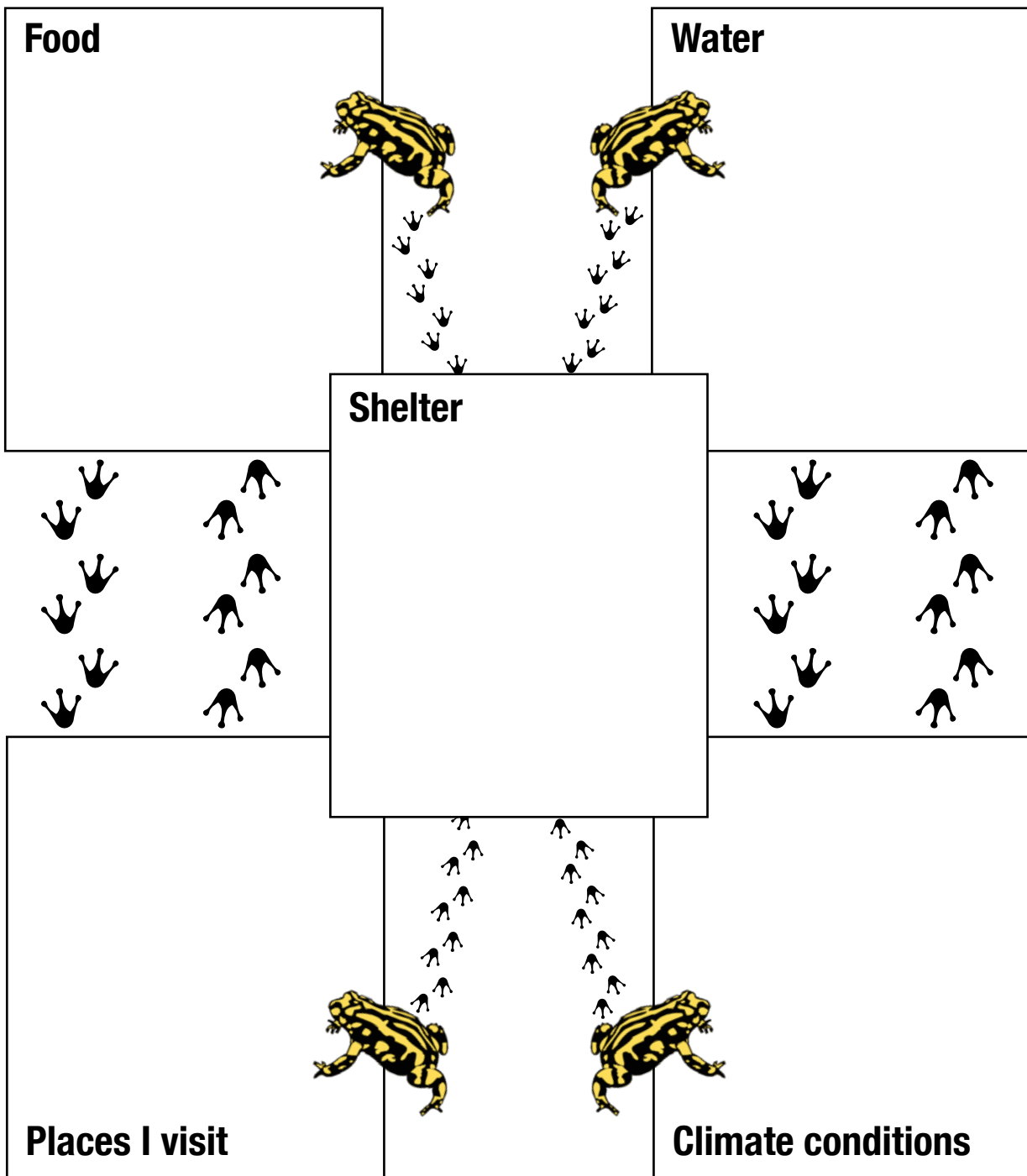
**Disadvantages: the limited range of the Corroboree Frog that they can only live in alpine regions around Kosciuszko National Park has probably proved a disadvantage due to once their population is effected by something, (like introduce predators, disease or development of roads etc.) it can easily influence the whole population of Corroboree Frogs.**



# What is habitat?

The term habitat describes the environment in which an organism lives. When we look at an organisms habitat we look at shelter, food and water. Climate plays a major role in an organisms habitat as many species have adapted to certain temperatures and need certain weather events to enable them to breed.

Research the Corroboree Frog and complete the following diagram.



# Living in an extreme environment

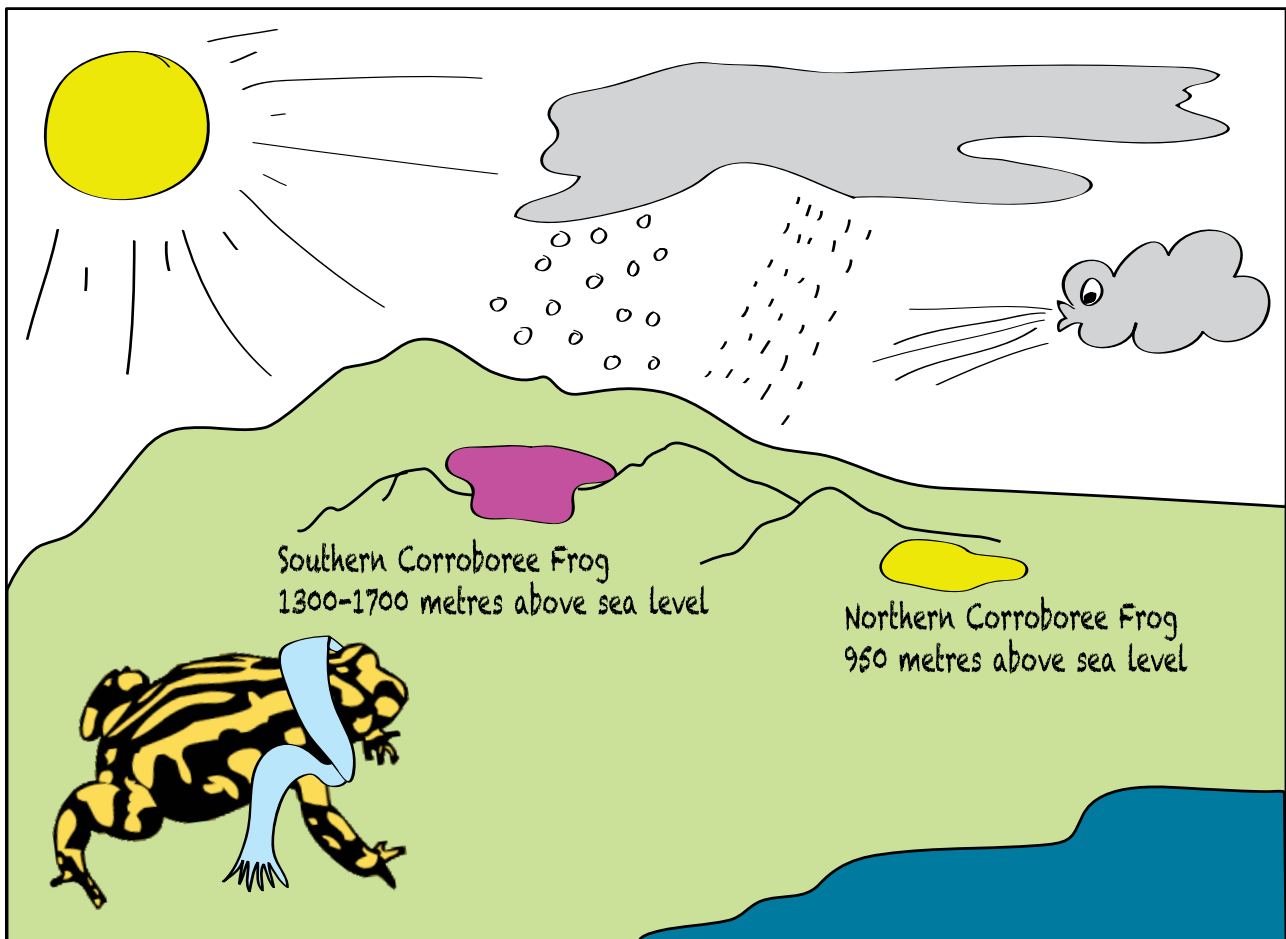
## Corroboree Frogs are **EXTREME** animals!

These little frogs have adapted to living in a very extreme environment in the alpine region of NSW. Living in this high altitude, freezing place means the Corroboree Frog has to overcome different challenges.

Your job is to show off the Corroboree Frog habitat by displaying the extreme environment where they live on a poster. Use your existing knowledge, information from previous activities or go to the following websites to find things you can put on your poster.

- [www.corroboreefrog.com.au](http://www.corroboreefrog.com.au)
- [www.murray.cma.nsw.gov.au/images/stories/Factsheets/corroboree%20frog.pdf](http://www.murray.cma.nsw.gov.au/images/stories/Factsheets/corroboree%20frog.pdf)
- [www.taronga.org.au/animals/corroboree-frog/feature](http://www.taronga.org.au/animals/corroboree-frog/feature)

You should include information like climate, food types, food sources, shelter, habitat, height above sea level, where they live in the mountains, what weather can affect them in this environment, how this environment affects breeding etc.



# Saving the Corroboree Frogs

The Corroboree Frog, both Northern and Southern, have been declared threatened species. The Southern Corroboree Frog is critically endangered with less than 50 individuals left in the wild.

The decline of Corroboree Frogs, and many other frog species throughout Australia, is mainly due to a disease known as **chytridiomycosis**, which is caused by infection with the Amphibian Chytrid Fungus (pronounced *kit-trid*). This fungus originated in Africa and is thought to have been introduced to Australia from the African Clawed frog (*Xenopus laevis*). Historic grazing, development and drought due to climate change have also had a major effect on the Corroboree Frog habitat reducing the alpine bogs that they live in.

Both the Northern and Southern Corroboree Frogs are in danger of becoming extinct in the wild unless we make efforts to help them repopulate and protect their native habitats.

Corroboree Frogs are kept in captivity for breeding in specially designed facilities managed by the Amphibian Research Centre, Zoos Victoria, Taronga Zoo and Tidbinbilla Nature Reserve. Wirraminna Environmental Education Centre has recently been honoured with the opportunity to help the Corroboree Frog population by hosting some juvenile individuals. These frogs are kept in special climate controlled tanks that have been set up to resemble the Corroboree Frog habitat in their native alpine regions.

Watch the following video's and answer the questions relating to the efforts to help the Corroboree Frogs.

## **Two men on the Great Divide: Corroboree Frog**

[www.youtube.com/watch?v=zFOwFaUUHBU](http://www.youtube.com/watch?v=zFOwFaUUHBU)

## **Act wild for Corroboree Frogs**

[www.youtube.com/watch?v=fEF-VwpdJJI](http://www.youtube.com/watch?v=fEF-VwpdJJI)

## **Corroboree Frog - Sheena Thacker**

[www.youtube.com/watch?v=ajNXn-WQddw](http://www.youtube.com/watch?v=ajNXn-WQddw)

## **The Frog Hunters - The effort to save the Southern Corroboree Frog**

[www.youtube.com/watch?v=0PqdS64w8PI](http://www.youtube.com/watch?v=0PqdS64w8PI)



# Saving the Corroboree Frogs

## Two men on the Great Divide: Corroboree Frog

1. The Corroboree Frogs are described as once carpeting the mountain marshes but now are on the point of .....
2. When studying Corroboree Frogs the first step is to be able to find them. How does Dr. David Hunter get the attention of the frogs? What do you think he is calling?  
.....  
.....

## Act wild for Corroboree Frogs

3. The two types of Corroboree Frog are:  
.....  
.....
4. What does Rachel the Frog Keeper love about the Corroboree Frogs that resembles a fingerprint?  
.....  
.....
5. What awesome thing can Corroboree Frogs do that most other frogs can't?  
.....  
.....
6. What is the main goal of Zoo's Victoria concerning the Corroboree Frog?  
.....  
.....

# Saving the Corroboree Frogs

## Corroboree Frog - Sheena Thacker

7. What does Michael McFadden identify as the main cause of decline for the Corroboree Frogs?

.....

8. Where did this fungus originate? .....

9. How does the fungus affect frogs? .....

.....

10. What does Taronga Zoo hope to do with the Corroboree Frogs from their breeding program?

.....

.....

## The Frog Hunters - The effort to save the Southern Corroboree Frog

11. Why is this day so special for Taronga Zoo and Zoo's Victoria?

.....

12. How many Southern Corroboree Frogs are thought to be left in the wild? .....

13. Where do they place the Corroboree Frog eggs? .....

14. Describe how they release the Corroboree Frog eggs.

.....

.....

15. Why do the eggs have to be made to sink to the bottom? .....

.....

Further information about Corroboree Frogs

**National Recovery Plan**

[www.environment.gov.au/biodiversity/threatened/publications/recovery/pseudophryne-corroboree-pengilleyi.html](http://www.environment.gov.au/biodiversity/threatened/publications/recovery/pseudophryne-corroboree-pengilleyi.html)

**Corroboree Frog**

[www.corroboreefrog.com.au](http://www.corroboreefrog.com.au)

**Taronga Zoo Conservation Society**

[www.taronga.org.au/animals/corroboree-frog/feature](http://www.taronga.org.au/animals/corroboree-frog/feature)

**Project Corroboree**

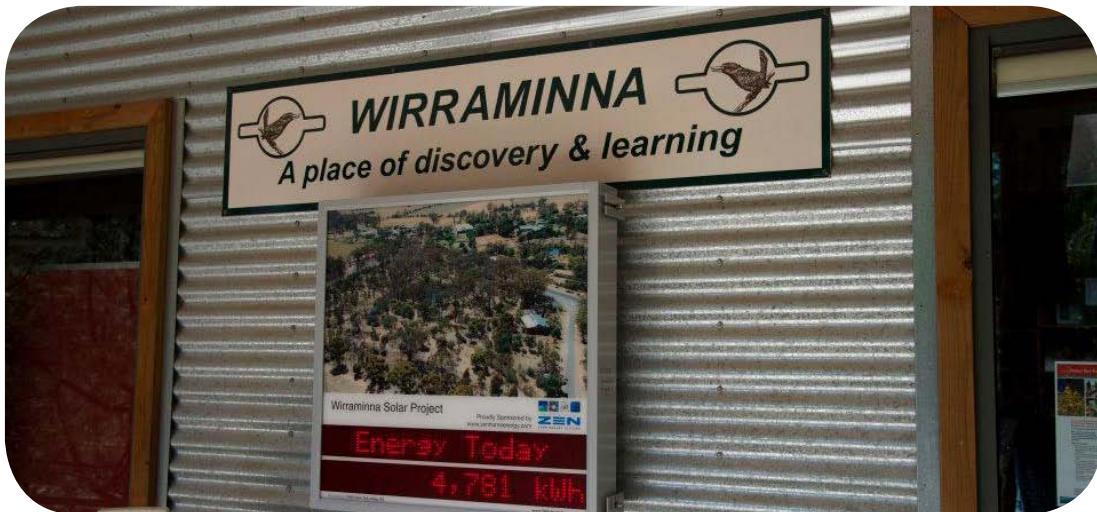
[www.frogs.org.au/corroboree/](http://www.frogs.org.au/corroboree/)

**Melbourne Zoo**

[www.zoo.org.au/melbourne/animals/southern-corroboree-frog](http://www.zoo.org.au/melbourne/animals/southern-corroboree-frog)

**Amphibian Ark**

[www.amphibianark.org](http://www.amphibianark.org)



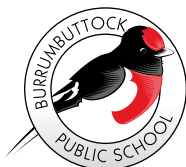
**Wirraminna Environmental Education Centre**

via Burrumbuttock Public School

Howlong Road, BURRUMBUTTOCK NSW 2642

Tel: 02 6029 3253 | Fax: 02 6029 3235

[www.wirraminna.org](http://www.wirraminna.org)



**Catchment Management Authority**  
Murray