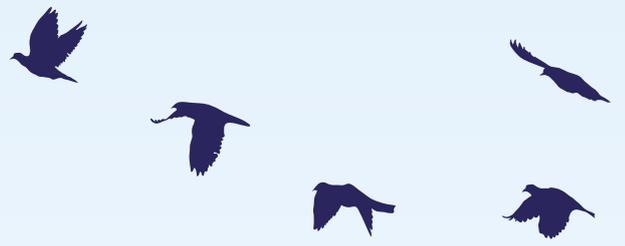


HOP INTO FROGS

A teaching resource about frogs and wetlands around Corowa and districts



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Corowa District Landcare's "Sounding the Chorus of Frogs in Corowa Wetlands"

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Sloane's Froglet
Photo: Damian Michael

INTRODUCTION

About this resource

Hop into Frogs has been created for students and educators in the Corowa region to support frog-related learning opportunities and experiences in schools. The content is tailored to the local environment and local frog populations. *Hop into frogs* provides students with a real-life application while encouraging the exploration of wider environmental issues and environmental citizenship in class and outside of school.

There are two main components of *Hop into Frogs* - the teaching resource (this document) and an interactive presentation.

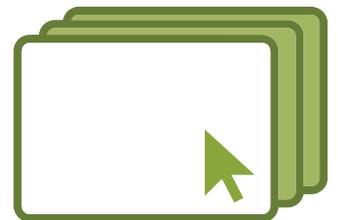
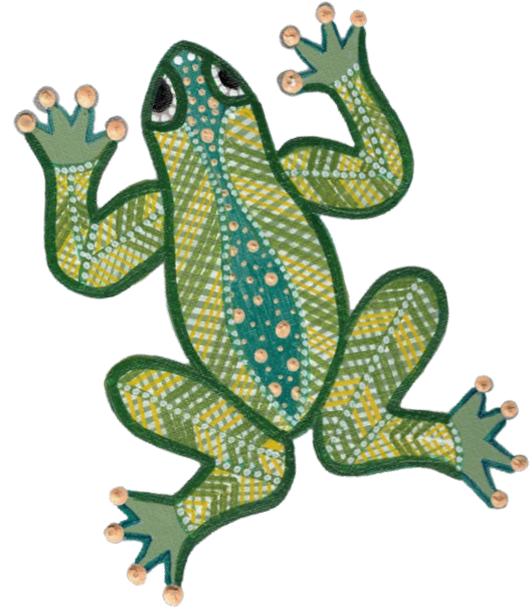
Teaching resource

The teaching resource is broken into two sections:

All about frogs: This provides technical background content for teachers to learn more about frogs, the species found around the Corowa region and the habitats where they occur. Teachers are encouraged to use this background content with students to support further research and investigations into frogs.

Class activities: This provides a range of activities for teachers to run with their Stage 2 and 3 students. Teachers can tailor these activities to suit the younger Stage 1 students, as well as older Stage 4 students.

Each unit of activities is aligned to the content presented in the interactive presentation. Direct links to presentation slides are identified by the icon shown to the right. In the PDF, you can click on this icon to open the interactive presentation



bit.ly/HopIntoFrogs

Interactive presentation

The interactive presentation is an online resource that can be used on desktop computers, SmartBoards, tablets and even smart phones. The class activities have been linked to the content in the presentation with many activities requiring access to various Slides to complete the class work.

There are four sections to the presentation, with a number of options for navigating through the slides. If in doubt, you can click on the Home icon located on each page, or click on the Info button located on each section title page.

At the end of each section is a pop quiz that students can complete to test their knowledge.

Artwork: David Dunn

Curriculum aligned

Hop into Frogs is aimed at students from Stage 2 to 3 (Years 3 to 6) and can be used either as a whole unit or as separate activities.

The scientific terms used in **Hop into Frogs** are explained as they arise. Further study of scientific terminology is always encouraged to support and develop the scientific literacy of students.

NSW syllabus

The class activities are suitable for a range of student abilities. To assist teachers in planning their lessons, the following details have been included for each unit description:

- The targeted Stage (year level) of the activity
- Syllabus outcome codes for key learning areas – see page 6 for Stage 2 and 3 outcomes
- Cross-curriculum priorities
- General capabilities that are applicable to student learning
- Background knowledge page references (All about frogs)
- Interactive presentation section references.

Useful resources

The Australian Museum's FrogID app is used to record and identify frog calls across Australia. If you have frogs around your school, you can take part in their school activities. FrogID has a series of resources available online to support teaching and learning about frogs. www.frogid.net.au



Additional activities you could try...

Plan an excursion to a local wetland. During winter, frogs can be heard during school hours.

Design and build a frog bog or pond at your school.

Run a fundraising event for a threatened frog species in Australia.

Present the Tiddalik story as a play to the rest of the school.

Run a “frog expo” at school with information stalls and art activities.

Contact your local Landcare group to get involved in looking after a wetland/frog habitat.

Learn about water bugs and how to test water quality.

Share your knowledge with the wider community via your newsletter.

Get training on how to raise frogs in the classroom.

Develop frog art such as posters, frog garden sculptures, screen prints or drain stencils.

Stage 2 Outcomes

SCIENCE

ST2-4LW-S compares features and characteristics of living and non-living things

HSIE – GEOGRAPHY

GE2-1 examines features and characteristics of places and environments

GE2-2 describes the ways people, places and environments interact

GE2-3 examines differing perceptions about the management of places and environments

HSIE – HISTORY

HT2-2 describes and explains how significant individuals, groups and events contributed to changes in the local community over time

HT2-3 describes people, events and actions related to world exploration and its effects

ENGLISH

EN2-10C thinks imaginatively, creatively and interpretively about information, ideas and texts when responding to and composing texts

VISUAL ARTS

VAS2.1 represents the qualities of experiences and things

VAS2.2 uses the forms to suggest the qualities of subject matter

VAS2.4 identifies connections between subject matter in artworks and what they refer to, and appreciates the use of particular techniques

MUS2.1 sings, plays and moves to a range of music, demonstrating a basic knowledge of musical concepts

MUS2.2 improvises musical phrases, organises sounds and explains reasons for choices

MUS2.4 identifies the use of musical concepts and musical symbols in a range of repertoire

Stage 3 Outcomes

SCIENCE

ST3-4LW-S examines how the environment affects the growth, survival and adaptation of living things

HSIE – GEOGRAPHY

GE3-1 describes the diverse features and characteristics of places and environments

GE3-2 explains interactions and connections between people, places and environments

GE3-3 compares and contrasts influences on the management of places and environments

VISUAL ARTS

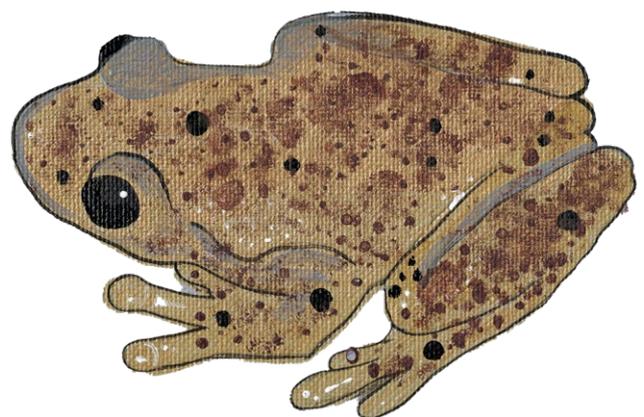
VAS3.1 investigates subject matter in an attempt to represent likenesses of things in the world

VAS3.2 makes artworks for different audiences, assembling materials in a variety of ways

MUS3.1 sings, plays and moves to a range of music, individually and in groups, demonstrating a knowledge of musical concepts

MUS3.2 improvises, experiments, selects, combines and orders sound using musical concepts

MUS3.4 identifies the use of musical concepts and symbols in a range of musical styles



Artwork: David Dunn

ALL ABOUT FROGS

Let's learn all about
the frogs of Corowa!



ABORIGINAL CULTURE AND FROGS

The importance of frogs in Australian ecosystems is well recognised and described by Australian Aboriginal people. Frogs play a role in Australian Aboriginal culture, for instance the well-recorded Australian Aboriginal Dreamtime story about Tiddalik the Frog has a spiritual component as well as providing a tool for learning Aboriginal lore.

The following Aboriginal story has been provided for this resource by Freddie Dowling.

Doogalook, the frog

Once there was Bpangerang man named Doogalook of the Milawa (meaning: sees water) Clan. He really lived up to being a Milawa man and of the frog totem, because he spent most of his life in the swampy areas swimming and hanging about in the water.

He was a solidly built man with a deep voice, and everybody knew when he was around.

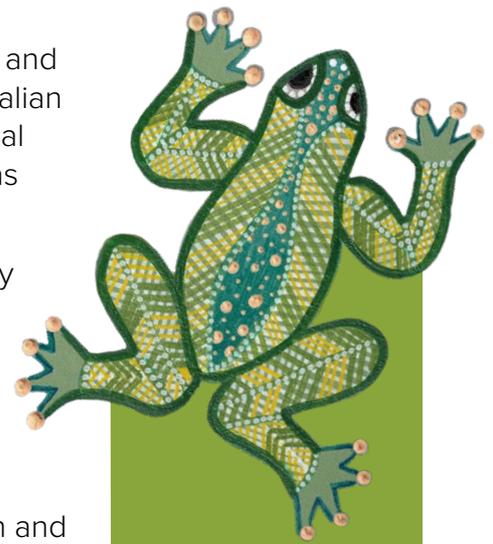
He was good natured and much loved by all the clan. When he finally passed away, his family took him to a dry swamp north of Wangaratta and buried him in a sandy area.

Next year when the snow on the mountains melted, and the spring rains gushed water down the rivers and creeks through Bpangerang Country, the swamp became filled with water.

That night, when the Milawa people were camped by the swamp around the campfire and telling age-old stories, one of the children yelled out "LISTEN" and everyone kept quiet. They all heard the sound above the usual frog sounds coming from the swamp "DOOGALOOK, DOOGALOOK, DOOGALOOK".

The whole clan then knew that Doogalook had returned as a big voiced and solid frog, which was his totem. He was happily living again in the water like he always had and was calling out to let the people know who he was and that he was alright.

And now, all of his descendants are still calling out his name from the water, so that he will never be forgotten.



ARTIST DAVID DUNN

David is an award winning, international selling Aboriginal (Wiradjuri) artist with art pieces distributed around the world. He uses contemporary techniques, based on Indigenous stories built around silhouettes. David's painting style is simple, colourful, intelligent and he is an artist who respects his culture.



Artwork: David Dunn (top) and Fay Voss (below)

FROGS AND THEIR IMPORTANCE

Frogs are amphibians

Frogs lead a double life. As tadpoles they live in water, breathe through gills and are mostly herbivores (plant eaters). As adults they are completely different. They breathe with lungs, live on land and are carnivores (meat eaters). They return back to the water to breed. This double life is reflected in their name. The word amphibian comes from two ancient Greek words, **amphi** meaning double and **bios** meaning life.

Amphibians are one of five groups belonging to **Vertebrates** - animals that have a backbone. The other four vertebrate groups are fish, reptiles, birds and mammals.

Amphibians can be divided into three groups: Anura, Urodela and Gymnophiona. These vary in shape and size but they all have moist, permeable skin and are ectothermic (cold blooded).



Spotted Grass Frog
Photo: Matt Roberts

Anura (Frogs and toads)

They have no tails, long legs and a compact body. This is the largest group of amphibians with approximately 5000 species of frogs and toads.

Urodela (Salamanders and newts)

They have a long tail and short legs and their body is longer and thinner than a frog's body. Approximately 400 species of newts, salamanders and sirens belong to this group.

Gymnophiona (Caecilians)

They have no legs and look like worms. This group includes around 200 species of caecilians, which mainly occur in the soils of tropical rainforests.

Australia has over 260 species of native frogs. There is only one introduced species - the Cane Toad. There is also only one species of Caecilian in Australia. It was introduced and has now become naturalised. Australia has no native salamanders or newts.

FUN FACT

The oldest frog fossil is 160 million years old.
The oldest fossil in Australia is 54.5 million years old.



Frogs are important

Frogs are important to both humans and the environment. Frogs and tadpoles provide a vital link in the food chain of many ecosystems. Tadpoles act as natural nutrient filters and can help control levels of algae in aquatic ecosystems. Tadpoles and frogs do a great job helping to control insect populations. For instance, the tadpole of the local Peron's tree frog (see page 28) eats mosquito larvae, and the adult frog is often seen on windows, catching insects at night.



Sudell's Frog
Photo: Matt Roberts

Most importantly, frogs are messengers about the state of our environment. Frogs provide their messages about the overall health of both aquatic (water) and terrestrial (land) environments. This includes information about water quality and quantity, habitat quality and connectivity and the quality of our soil.

Worldwide there has been a severe decline in the number and diversity (variety of species) of frogs. Declines in their distribution (the geographic area a species occupies), and abundance (number of individuals of a species) give humans a warning that the health of the environment is declining.

A number of factors are contributing to the worldwide decline of amphibians, including pollution of waterways, loss or degradation of habitat, climate change, changes in water use and availability, widespread use of chemicals, and spread of amphibian diseases (particularly the chytrid fungus, see page 19).

Currently, 37 of Australia's frog species are listed as threatened under the national *Environment Protection and Biodiversity Conservation Act 1999*. Four Australian frogs have already been declared as extinct. Globally, around 40% of all frog species are in decline.

In the Corowa region, we have removed or altered large areas of frog habitat and introduced a range of potentially harmful chemicals into our environment. Many of our local frogs are burrowing species that live underground for large parts of their lives. Loss of soil organic matter and compaction of the soil affects these frogs. In addition, frogs are negatively affected by climate changes.

If we accept that frogs are an indicator species and that this is a warning - that the frogs are trying to give us a message and are telling us a story - then it is in everyone's interest to look after our frogs and their habitats.



Take action!

We can all play a part in making sure our frog populations are healthy and safe. Some ideas include:

- Identify and protect local frog habitat
- Monitor the water quality in frog habitats to track changes over time and to identify issues early on
- Minimise or eliminate the use of chemicals at home or at school. Always dispose of paints, oils, detergents etc. safely
- Create frog-friendly habitat in our own backyard or school ground
- Keep cats inside at night
- Help others to appreciate and look after frogs and our environment
- Implement a Wetland Action Plan

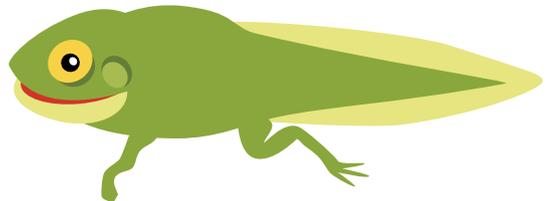
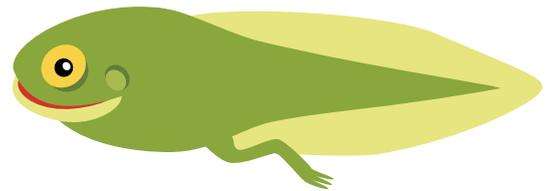
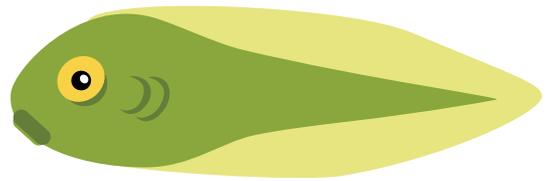
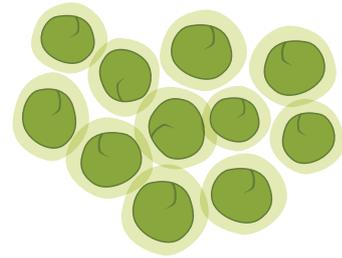


FROG LIFE CYCLE

During their life cycle, frogs grow and go through drastic changes in body structures and their functions. These changes include absorbing the tail into the body, developing legs to walk or hop, growing lungs to breathe, and forming a wide jaw and bulging eyes.

This conspicuous transformation is called metamorphosis and prepares the frog to live on land.

1. Wherever the eggs were deposited after laying, the hatching of the tadpoles may take several days. The egg yolk provides the energy for the developing tadpole, while in the egg and for a few days after hatching. The young tadpole uses external gills and its skin for breathing.
2. The tadpole starts eating plant matters and algae, using its horny beak and rows of teeth. Internal gills replace the external ones.
3. The hind legs appear as small buds at the outside of the body and the front legs start growing at the inside.
4. The internal gills are replaced by lungs and the tadpole frequently gulps air at the water's surface. The body shape starts changing and becomes wider.
5. The hind legs are fully formed, and the front legs begin to press out of the body.
6. The front legs emerge from the body.
7. The tadpole body transforms - the mouth organs are lost, the skull, including the jaw widens, the intestines shorten, and the eyes grow. Food cannot be eaten and digested during these changes and instead, the young frog re-absorbs the energy stored in the tail. When the young frog is ready to move out of the aquatic (= in water) into its terrestrial (= on land) phase the tail has shrunk and shortened (it is not lost!).
8. The young frogs eat small animals, like flies and crickets and will grow into an adult frog over the next few months.



FROG BIOLOGY

Reproduction - Sending out the call

Frogs can best be heard during their breeding season. Male frogs call to attract a female and to stake out their territory. Each frog species has a specific call so that they do not attract the wrong mate! The louder the call, the more females a male frog is likely to attract. Female frogs do not call but instead listen to the calls and choose a mate based on the loudest, deepest and most repeated call.

By studying the calls of your local frog, you can tell how many species and how many individuals of each species are at a wetland.

Most frogs breed seasonally when conditions of temperature, day-length and moisture are right. Many species take advantage of heavy rainfall events to breed. In Corowa there are several winter-active species of frogs which breed during the cooler, wetter winter months. This includes Sloane's Froglet. Other frogs are active when the weather warms up in spring, such as the Peron's Tree Frog. Fewer frogs are calling or breeding during late summer and autumn – usually our driest times. It is common to see tadpoles swimming in ponds at different times of the year.

When mating the male and female frog embrace in a “piggy-back” called amplexus, with the male sitting on the females back. While the female lays eggs, the male fertilises them (external fertilisation) and a mass of eggs (or spawn) is produced. Some frog species form spawn into a floating raft, while other species have eggs that sink to the ground or are attached to vegetation under the water's surface. The development from egg to frog is a continuum of approximately 40 different stages.

A frog life cycle diagram reduces the developmental steps to 6-8 main stages: eggs, tadpole with external gills, tadpole with internal gills, tadpole with hind leg buds, tadpole with hind legs, tadpole with all 4 legs, young metamorph or froglet/toadlet, adult frog.



*Peron's Tree Frog calling
Photo: Geoff Heard*



*Sloane's Froglets in amplexus (mating)
Photo: David Hunter*

Breathing with gills, lungs and skin

Frog skin is permeable, which means that water and gases can easily pass through it. Frogs absorb oxygen through their skin, which has a fine mesh of blood vessels for gas exchange. Frogs can use this technique on land and underwater. Mucous membranes keep the frog skin moist when out of the water to assist the oxygen absorption. Frogs also breathe through their lungs and the lining of their mouth.

Tadpoles use external then internal gills, lungs and their skin to breathe.



Frog skin features

All frogs have skin glands that produce different compounds that cover the skin. Some of these can be toxic. These toxins protect the frog from a whole range of organisms, such as bacteria and fungi that might infect the skin, and other animals that might eat the frog (snakes or birds).



Dietary requirements

The tadpoles of most frog species eat algae, micro-organisms, and plant matter. They might also eat decomposing matter, such as dead fish. In some cases, where too many tadpoles compete for very little food, these mostly vegetarian animals may turn cannibalistic and eat each other!

In stark contrast, adult frogs are always carnivorous, eating mainly invertebrates (animals without backbones), such as insects. Some larger frog species will also eat vertebrates (animals with backbones), including other frogs, lizards, birds, snakes, rats, and small mammals such as bats or mice.

Tadpoles have a horny beak made out of keratin like your hair and nails. They also have many rows of spikes, called labial teeth that work like a rasp to scrape off algae or plant material.

Frogs use their sticky tongue to catch their prey. The tongue is attached at the front of the mouth and can be flicked out at breakneck speed. Frogs do have minute teeth in the upper jaw, but these are only used to hold food rather than for biting or chewing.



On the menu

Frogs and tadpoles are an important food for other animals. Tadpoles are eaten by fish, large insects, and some birds. Frogs are on the menu of birds, snakes, large lizards, cats and foxes and many other mammals, including humans.



FROG ADAPTATIONS

What is an adaptation?

An adaptation is a special skill that helps a plant or animal to survive. Adaptations can be:

- Physical – how a plant's structure or animal's body changes.
- Behavioural – how an individual or a community reacts to their surroundings or works together.

Many species have adapted to their habitat to help them survive by using skills like camouflage, being nocturnal (being active at night), feeding on particular plants or animals and lasting for long periods without food or water. Frogs have a number of adaptations for survival and below are just some of these.



Using adaptations to survive dry times

Frogs need moisture to breathe, reproduce and generally to survive and thrive. Many frogs are nocturnal (active at night). Being nocturnal reduces the risk of drying out, as temperatures during the night are lower than during the day. It also makes it easier to avoid being spotted by a predator.

Around Corowa, a number of frog species are active during the day during winter. These are winter-breeding frogs and include the threatened Sloane's Froglet.

Despite being dependent on water, frogs have evolved to occupy a variety of habitats. Frogs live in deserts, rainforests, alpine areas and coastal heathlands. They also live in backyards, golf courses and industrial sites.

Frogs that live in very dry areas, survive between rare rain events by burrowing underground, storing water in their bodies and secreting mucus to waterproof their skin. Our local frog species have evolved with different adaptive strategies to survive in the Corowa climate. Corowa's weather is borderline Mediterranean and humid subtropical climate with hot, mostly dry summers and cool wetter winters.

For protection, some frogs can climb trees and hide behind the loose bark of Eucalypts, while others have strong back legs to help them burrow into the soil. To escape the heat (as well as predators) and maintain their skin moisture, some frogs find refuge in old logs, underneath rocks and amongst thick grass tussocks.

Colour and camouflage

For camouflage, many frogs can change their basic colour to a lighter or darker shade. They also use this to help control their body temperature, as darker colours absorb more heat radiation.

Some frogs, like the Corroboree Frog, have bright colours to warn predators of their toxic skin.



Tympanum, or ear

Frogs have ears on the side of their head. Their ear is called a tympanum, which means drum. This is because they have a membrane over the top of their inner ear that protects it in the water. The membrane 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 tympanum is situated behind the frog's eye and is small in some species and large in others. The tympanum is built in such a way that it allows frogs to emit their loud calls without hurting their own eardrums, and to locate the position of other calling frogs.



Tongue

Frogs have soft, sticky tongues that, unlike humans, are attached to the front of their mouths. This allows them to quickly expel their tongues out of their mouths to stick it to or wrap it around their prey. The tongue then equally quickly retracts, pulling its prey back into their mouths. The stickiness is caused by a gland inside the mouth secreting “glue” onto the tongue.



Eyes

On land, frogs hunt by using their vision. They have very good eyesight that is based on movement. This means that they can only see their prey or avoid predators that are moving. Frogs are able to make their eyes bulge out to see in many directions at once.

Frogs often blink while they are eating. They swallow their prey whole and push their eyeballs into their sockets, which helps push food down their throats. This is made possible, as frogs do not have bones separating the eye sockets from the mouth cavity. Instead they only have a membrane so that the eyeballs can be moved back and forth.



Legs

Frogs have very powerful legs that can allow them to make huge jumps considering their size. This is great for hunting and escaping predators! The South African Sharp-nosed Frog jumped over 10m in only 3 jumps. The biggest jump was 5.35m! The frog itself is only 55 - 66mm long. If a human jumped the same distance in relation to his body length it would mean a 100m jump!

Frog legs are also great for jumping up. The American Cricket Frog jumped 62 times its body length. If a human wanted to copy that it would mean a 120m high jump.

How is this possible? Frogs have coiled tendons, like in a compound bow, to jump great distances and heights. 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. Frogs do not drink but rather absorb water directly through their skin in an area known as the drinking patch, located on their belly and the underside of their thighs.

Frogs also absorb most of their oxygen through their skin.

The skin must be moist for these processes to work. If a frog's skin becomes too dry it will have trouble absorbing oxygen and releasing carbon dioxide. If a frog is dry for too long, it will suffocate and die.

All frogs use chemicals in their skin to fend off bacteria and fungi that might infect their skin. Some frogs have toxic skin, to protect them from predation.



Smell

Frogs usually breathe through their nostrils with their mouths shut. They have sensitive areas around their eyes and on their skin to detect chemical changes in the air given off by predators or food, or during the breeding season to find a mate.



FUN FACT

Worst smelling frog is the Venezuelan Skunk Frog. It is the largest member of the poison-arrow family (Dendrobatidae).

FUN FACT

The Wood Frog in Alaska can tolerate freezing for 7 months each year and comes back to life in spring.

Photos: Kelly Coleman, Alexandra Knight and Geoff Heard

THREATS TO FROGS

Chytrid fungus

Chytrid fungus (pronounced kit-rid) is a disease that has caused frog extinctions and major declines around the world and in Australia, especially in cooler areas with higher elevation. Chytrid attacks the keratin in the frog's skin. Frogs need their skin for respiration and water regulation and the fungus makes it difficult for the frog to breathe. The fungus also damages the nervous system, affecting the frog's behaviour, making them sluggish and lethargic and unable to feed or defend themselves.

Chytrid fungus is probably transferred by direct contact between frogs and tadpoles, and through exposure to infected water. The disease may not kill frogs immediately, and they can swim or hop to other areas before they die, spreading fungal spores to new ponds and streams.

Minimise the risk of spreading the chytrid fungus and other diseases.

DO NOT:

- move tadpoles and frogs from one area to another and to avoid touching or handling frogs
- pick up a frog without wearing gloves!

YOU SHOULD:

- always clean wet or muddy boots and tyres before and after entering a wetland
- always clean fishing, camping, gardening or frog-surveying equipment before taking it into new areas.



Symptoms of the terminal stages of chytridiomycosis include the half-closed eyes and generally depressed attitude seen in this frog, and an accumulation of cast-off skin (the greyish crescent shape near the top rear end of the frog) (Lee Berger).

Image source: *Chytridiomycosis* (Amphibian chytrid fungus disease) - Fact sheet (Australian Government, 2016)

FROGS AND CANE TOADS

Cane Toads, *Raniformis marinus*, were introduced into Queensland in 1935 and have spread into the Northern Territory, Western Australia and New South Wales. It is expected that they will continue to spread. Cane Toads have a huge impact on Australian ecosystems, poisoning native animals that eat them and competing with other freshwater species (including frogs) for habitat and food resources.

Cane Toads can be accidentally transported in landscaping supplies and pot plants to places where you would not expect to see them. Some native frogs have been killed when they have been mistaken for these hitch-hiking cane toads.

In the Corowa region the frogs most commonly mistaken for the Cane Toad are the Giant Banjo Frog, *Limnodynastes interioris*, and the Eastern Banjo Frog, *Limnodynastes dumerillii*. There are descriptions of both these frogs in the next section.

It can be hard to tell the difference between a Cane Toad and a native frog. One of the most distinctive differences is the large paratoid glands behind their shoulders – so take a careful look for this. Remember, Cane Toads produce poison, so do take care. Cane Toads also have a distinctive call – a low, long trill quite different to any other native species. The Australian Museum website has more detailed information about identifying and reporting Cane Toads.



Giant Banjo Frog



Eastern Banjo Frog



Paratoid gland
(poisonous)

FUN FACT

A female Cane Toad lays 30,000 - 35,000 eggs each breeding cycle.



Photos: Geoff Heard and Natasha Lappin

FROGS OF THE COROWA REGION

In Australia, the main two frog groups are called tree frogs and southern frogs. Tree frogs tend to have very obvious expanded pads on the tips of their fingers and toes, which help them with climbing. Southern frogs mostly have very simple, pointed fingers and toes with no pads, and do not tend to climb. Both groups of frogs occur around Corowa.

Sloane's Froglet

Hello, I am a Sloane's Froglet.
Scientists call me ***Crinia sloanei***.



About Sloane's Froglet

Sloane's Froglet is a very small (around 15-20mm), native frog that lives in inland Victoria and NSW. This unique froglet was discovered in the late 1950's along the Murray River near Tocumwal by Murray Littlejohn and his wife Patsy.

Conservation status

Sloane's Froglets were once found across the western plains of NSW from the Murray River and its neighbouring areas in Victoria. This species has significantly declined across its range and some of the most important remaining populations occur in Albury and Corowa.

The distribution (places where they are found), and abundance (numbers of frogs), of Sloane's Froglets have been reduced a great deal over the past 20–30 years.

In 2008 it was declared a Vulnerable species in NSW under the *NSW Threatened Species Conservation Act*. A species is eligible to be listed as vulnerable in Australia when it is facing a high risk of extinction in the medium-term future. Being listed as vulnerable was the first step in being recognised as an endangered or critically endangered species. In 2019, Sloane's Froglet was nationally listed as an endangered species under the *Environment Protection and Biodiversity Conservation Act 1999*.



Photos: Alexandra Knight and Joanne Diver

Habitat of the Sloane's Froglet

Sloane's Froglet lives and breeds in temporary and permanent water bodies including oxbows off creeks and rivers, farm dams, large and small natural wetlands, constructed frog ponds and temporary puddles. They occupy water bodies that either contain a shallow vegetated area or are next to an ephemeral (or temporary) one. This species seems most abundant in wetlands that have little or no shading.

Description

Male and female Sloane's Froglets have backs that are brown or brownish-grey, often with darker brown or olive markings, and males may also have orange or ochre coloured spots. Their bellies are usually white with some darker blotches and greenish marbling under the chin.

Call

The Sloane's Froglet is hard to see and hides quickly, so the best way to identify it is from its call. The male emits a single sharp 'eeh', often repeated in close succession, that can be heard during the day and at night.

Breeding

Sloane's Froglets breed in a large number of water body types. Generally, they breed in still water or water with only little flow. The Sloane's Froglet breeds in winter and requires water bodies that contain shallow water (around 20cm deep). It prefers wetlands that contain riparian and aquatic vegetation. Most often it has been found in water bodies that contain grasses and reeds that are of medium height and have small stem diameters such as couch, water-couch or the common spike rush, *Eleocharis acuta*. Water bodies containing this type of vegetation are essential for Sloane's Froglet as it lays its eggs attached to the vegetation rather than a frothy mass on the surface of the water like some other frogs.

As well as requiring particular breeding habitat during the breeding season, Sloane's Froglets need access to good refuge sites during the rest of the year. The climate in inland Australia is extremely variable. Moist or wet areas are needed as "stepping stones" for the Sloane's Froglets to safely move across the landscape between habitats. Therefore, it relies on roadside and table drains, irrigation channels and inundated grasslands to move from one spot to the other.



Photo: Alexandra Knight

Saving Sloane's Froglet

Water

Like most other frogs Sloane's Froglets rely on water for breeding. A range of permanent and ephemeral wetlands will ensure that Sloane's Froglet can find the right habitat to breed in.

Connectivity

Having good connectivity between wetlands is important to provide Sloane's Froglets with a range of alternatives if their wetland dries up. Connectivity will also help them move between water bodies, find food and breed with other populations of Sloane's Froglets.

Vegetation surrounding the wetland

To support the seasonal moving patterns between breeding and refuge habitats, water bodies need to be surrounded by vegetation that allows easy passage while still providing good ground cover for shelter. Careful stock grazing can help enhance vegetation around wetlands that support Sloane's Froglet.

Vegetation in the wetland

Having plenty of aquatic vegetation and shallow areas in a wetland is important for all life stages of the Sloane's Froglet. The eggs of this species are either attached to underwater vegetation or deposited in shallow areas with many plants. Tadpoles and adult frogs find shelter and food in the pond vegetation.

Predatory fish

Controlling invasive pest-fish, like Oriental Weatherloach, Gambusia and European carp will keep eggs, tadpoles and froglets safe from predation and other adverse effects caused by these species.



Photos: Damian Michael (above) and Alexandra Knight



Common Eastern Froglet

Hello, I am a Common Eastern Froglet. Scientists call me ***Crinia signifera***. I am one of the most common and widespread species in south eastern Australia.



Where do I live?

On the ground (rather than trees). Found pretty much everywhere including marshes, ponds, seepages and farm dams, from sea-level to above 2000m altitude in the alpine zone. I love hiding under things, such as logs and rocks, as long as it's moist under there. When laying my eggs, I attach up to 250 of them to vegetation on the bottom of the pond.

How do I look?

I am tiny, no more than 30mm and very hard to spot. My colouration is extremely variable (see photo) and I have a black and white mottled belly.

How do I sound?

My call is a characteristic repeated clicking, "crick...crick...crick...crick..."

When can you hear me?

You can hear my call pretty much all year round, day and night. So, if you hear a frog it is very likely one of my mates! I begin calling regularly from pools during the wetter parts of winter and spring.

Photo: Peter Robertson

FUN FACT

I am one of few frogs that breed in winter.



Eastern Sign-bearing Froglet

Hello, I am the Eastern Sign-bearing Froglet or Plains Froglet. Scientists call me ***Crinia parinsignifera***. I'm very similar to *Crinia signifera* BUT my call is very different, and I do not occur in high elevations



Where do I live?

Very common in the Corowa area. Found near deep farm dams in the open country and plains below 800m. I am ground-dwelling and shelter under logs and other debris, usually in moist depressions or near the water. You can often find me with dozens of my friends under one log or rock or hiding underneath a big clump of reeds on the edge of the water. I lay my eggs in ponds, dams, swamps, flooded grassland, ditches and hollows.

How do I look?

I am only 30mm long. My colour ranges from light to dark. The pattern on my back is variable, ranging from smooth and unpatterned to strongly marked and raised longitudinal stripes and bumps.

How do I sound?

My call is a slight drawn out "wwrreeeeekk", which I repeat regularly.

When can you hear me?

I call from vegetation at the water's edge or emergent vegetation. I prefer standing water but can sometimes be heard calling from slow moving stretches of streams and rivers.

Photo: Geoff Heard



FUN FACT

Telling me and the Common Eastern Froglet apart based on our looks is very tricky. The best way to tell is to listen to our calls, which are quite different.

Eastern Pobblebonk Frog

Hello, I am the Eastern Pobblebonk, or Banjo Frog. Scientists call me ***Limnodynastes dumerilii***. I'm a common and widespread burrowing frog in South-Eastern Australia.



Where do I live?

You can find me in rainforests as well as in really dry zones but not in high elevations of the alpine region. I like to lay up to 4000 eggs in the still water of swamps, dams, lakes and creeks. In the Corowa region I occur in town, often in your garden, as well as in farm dams and natural wetlands.

How do I look?

I grow up to 80mm and I am quite round and solid with thick strong legs. I am grey-brown in colour and have a white to orange granular stripe from below the eye to above the base of my front leg and a broad, dark band from the eye to the "ear".

I have a large raised lump on the outside of each thigh and on the underside of each foot for digging. My belly is mottled with brown-yellow spots.

How do I sound?

My sound is a deep, slow repeated "thud" or "bonk". When lots of males call in a pond it may sound like someone is playing a banjo.

When can you hear me?

You can hear my call most likely at night, but sometimes I do also call during the day. I like to call from the water or from the edge of the pond.

Photo: Natasha Lappin

FUN FACT

Limnodynastes means: Lord of the marshes. All frogs from this genus lay their eggs in frothy white floating raft, often attached to the pond vegetation.



Giant Banjo Frog

Hello, I am the Giant Banjo Frog and some people call me the Giant Bullfrog. Scientists call me ***Limnodynastes interioris***.



Where do I live?

I can be found in open areas and woodlands and in agricultural land. I can also occur in dry forests, but you are much more likely to find me in flood plains and in sandy soils. I like to breed in the water of swamps, ponds or dams, or in hollows along the banks of slow moving or still water bodies.

How do I look?

I can grow up to 90mm long. I do look a bit like the big brother of the Pobblebonk. We both have very similar colours, a thick granular stripe of cream to orange colour from below the eye to the arm, and a large swelling, called tibial gland, on each thigh. However, my belly is as yellow as a lemon!

How do I sound?

My call sounds similar to the “bonk” of the Pobblebonk, but my “bonks” or “gunks” or “donks” do sound much deeper.

When can you hear me?

You can usually hear me after heavy rain, especially in early Spring Only then do I come out of my underground hideout, to find a mate, fill my tummy and once that is done, to dig myself back into the soil again.

Photo: Geoff Heard



FUN FACT

I have a tough, spade like nodule on the middle part of each foot, that is a great tool for digging.

Spotted Grass Frog

Hello, I am a Spotted Grass Frog. Scientists call me **Limnodynastes tasmaniensis**. I am very common throughout my large distribution range and extremely common in the Corowa area.



Where do I live?

I can be found in a wide range of habitats, such as open forests, shrubland and grassland. I like permanent and semi-permanent water bodies as well as floodplains and call many farm dams my home. I lay my eggs in still water of ponds, lakes, swamps, dams and flooded areas. I live in large numbers in many of the farm dams around Corowa.

How do I look?

I have beautiful blotches in a neat pattern of dark and light markings all over my body – that is why they call me SPOTTED. I often have a distinctive red or orange stripe down the centre of the back and a white line from beneath the eye to above the front leg. I do not have toe pads.

How do I sound?

My call sounds like a staccato of uk-uk-uk. Children love to call me machine-gun frog.

When can you hear me?

I call while floating in water, often hiding amongst vegetation. I do call at night but also during the day, especially after rain. I call in large numbers from mid-August onwards.

Photo: Matt Roberts

FUN FACT

If you find a frog in your swimming pool, it is most likely me!
Please help me to get out and prevent me from drowning!



Peron's Tree Frog

Hello, I am a Peron's Tree frog.
Scientists call me ***Litoria peronii***.

As my name indicates, I do spend a lot of my life on trees and my awesome toe pads make me a really good climber.



Where do I live?

I am quite common in farmland with dams, swamps and scattered large eucalypt trees or in wooded areas below 900m. I do spend a lot of times on trees and bushes where I shelter in hollows and under loose bark in deep cracks in dead timber. In drier regions I might call a rainwater tank my home. I lay my eggs in still water in dams, ponds and lagoons.

How do I look?

I am between 50 and 60mm long, have broad round toe discs and striking yellow and black mottling in my groin and behind the back legs. My colour can change rapidly from almost white to grey to brown. The give-away for my identification is my pupils, which appear cross-shaped.

How do I sound?

My call sounds like a loud descending rattle or crackle, with a shorter chuckling sound at the end: "cra-ah-ah-ah-ah-ah-ah-ahhk". I am often called the "maniacal cackling frog" because of this.

When can you hear me?

I love calling at night from dead trees, partly submerged logs, clumps of rushes and reeds and other elevated perches in the water or at its edge.

Photo: Geoff Heard



FUN FACT

Thanks to my large toe pads I am a really good climber. I often give people a fright when I climb up on windowpanes to catch insects at night. My tadpoles are very useful as they do eat mosquito larvae (wigglers).

Sudell's Frog

Hello, I am a Sudell's Frog, or a Spotted Burrowing Frog. Scientists call me ***Neobatrachus sudelli***.



Where do I live?

I live in the dry regions of Victoria, in New South Wales, southern Queensland, and pockets of South Australia. Here I live in woodlands, shrubland, mallee, open and disturbed areas. However, I do spend most of the year sheltering in deep burrows in the soil and I can only be found active on the ground at night after periods of very heavy rainfall, when the ground is completely soaked. Around Corowa I occur in large numbers in the Whitehead Street wetland and other large shallow wetlands.

How do I look?

I can grow up to 40mm long but overall, I am a small, squat and short-legged frog. My back has numerous small, raised wart-like

bumps that give it a rough, sandpaper-like appearance. In addition, my back has a broad pattern of greenish-brown and darker brown blotches. The pupils of my eyes form vertical slits. I have a prominent black tubercle under each foot. This is an important tool for my digging activities.

How do I sound?

My call is a soft ascending and lengthy sequence of evenly spaced clucking or soft popping sounds.

When can you hear me?

You might hear me at any time of the year, but only after extensive periods of wet weather.

Photo: Geoff Heard

FUN FACT

I do have lots of different common names: Sudell's Frog, Common Spadefoot, Painted Burrowing Frog. Can you guess where these names come from? Not much is known about my biology as I do live a secretive life, much of it underground.



WETLANDS AND HABITATS AROUND COROWA

Corowa, and the area around it, is unique. It contains a multitude of different types of wetlands: big canegrass wetlands, river red gum billabongs, farm dams, roadside drains, and sewerage treatment ponds. These wetlands are not only beautiful in and of themselves, but they play an important part in providing ecosystem services and in supporting a range of biodiversity, including birds and frogs.

Canegrass and Billy Button Wetlands

The Corowa region contains many large wetlands that provide habitat for countless waterbirds (including the Brolga), as well as thousands of frogs. Important examples include the Council-managed Whitehead Street wetland, and the privately owned Nulla Nulla wetland.



Billabongs, Oxbows and slow flowing parts of the river

River red gums surround many of the beautiful billabongs. Tree hollows in mature trees provide nesting places for parrots and homes for gliders, antechinus and possums. Moist leaf litter lying thickly on the ground supplies refuges for many frog species during dry times.





Farm dams

Managing farm dams to provide homes and food resources for native wildlife as well as agricultural water delivers benefits to the whole community. Constructing dams with varying water depths and some shallow areas as well as different types of vegetation will improve the habitat for frogs. Many of the local frog species live in farm dams and bury themselves in the adjacent earth when not active.



Roadside and Table drains (and some irrigation drains)

Roadside drains provide opportunities for frogs to disperse across the landscape and find new homes. They are connecting habitats. Young metamorphlings of Sloane's Froglet are often found using roadside drains in the Corowa region in Spring. Managing drains without spraying the vegetation is a key to retaining good habitat.



Water and sewerage treatment ponds

Sewerage treatment ponds and associated wetlands provide important habitat for many species of frog as well as wetland birds. Most importantly, these sites provide refuges for native fauna in times of drought. The Whitehead Street site not only provides a home for a diverse range of amphibians but also is often used by Magpie Geese. These majestic black and white native geese are common in northern Australia but disappeared from south-east Australia around 100 years ago as a result of loss of habitat.

Temporarily inundated grasslands

Depressions and puddles that fill with water every now and then provide important sources of food and breeding sites for frogs. Sites that may only be a few centimetres deep when filled and which contain grasses and reeds are often used by frogs to lay eggs. These puddles can be highly productive, with vegetation resources that respond quickly to rain and a huge variety of macroinvertebrates living in them.



Constructed frog ponds

Building a frog-friendly garden can assist in frog conservation. Local frogs may already occur in your garden or may move in if you create some frog habitat. Frog ponds should be built with shallow areas, and local native species planted in and around them. Don't bring frogs from other areas into your garden but allow local frog species to inhabit it. The Corowa Community Garden has a wonderful constructed frog pond which you can visit. Information about building a frog – friendly garden can be found in the Victorian Frogwatch's Bonking in the garden frogs.org.au/frogwatch/bitg.html.



Constructed stormwater wetland - Wodonga

CLASS ACTIVITIES

Let's have some fun!



1. FROG FACTS

Overview

The following activities aligns with **Section 1 – Frog facts** of the interactive presentation and the background knowledge on **pages 8-19**. These activities introduce students to the basic biology of frogs, their life cycle and the adaptations that help them to survive.

Activities

- 1.1 Living and non-living** – Students group living things and non-living things based on observable features.
- 1.2 Animal classification** – Students use a dichotomous key to classify animals based on their similarities and differences.
- 1.3 What I know about frogs** – Suitable for all students to develop a baseline of knowledge about frogs.
- 1.4 Frog adaptations** – Students are introduced to the different adaptations of frogs that help them survive in their environment.
- 1.5 Life cycle of a frog** – Students follow the different stages of a frog's life cycle through a number of activities.

Stage

Stage 2 to 3

Syllabus outcomes

Science

ST2-4LW-S

ST3-4LW-S

Cross-curriculum priorities

Sustainability

General Capabilities

Literacy

Background knowledge

Pages 8-19

Interactive presentation

Section 1 – Frog facts



bit.ly/HopIntoFrogs

Activity 1.1 Living and non-living

Description

Students group living things and non-living things based on observable features.

To understand the natural world around us, we must first understand the properties that make something a living or non-living thing. Review student knowledge and quiz your class about what they think makes something living thing or non-living.

Explain that:

- scientists have to look at an object's properties (characteristics) to help them decide whether it is living or non-living
- living things will have more similar properties to each other than living and non-living things.

Part A: Living similarities

This activity uses a Venn diagram to help students recognise similar properties in a variety of objects.

Give students a copy of the **Activity Sheet – Living and non-living things**. Explain to students that Venn diagrams are a way we can group similar properties together. The linked areas are properties that are shared between either two or all three (very centre link) of our objects. Demonstrate this on the board, pointing to the common regions.

Students are to fill in their Venn diagram to recognise the similar properties between the objects and answer the activity sheet questions. They should use the suggested properties as well as a number of their own observations.

Conclude activity by reinforcing that *'a living thing can be defined as something that is able to breathe, eat, drink, move, grow and reproduce'*.

Part B: Once living

This activity further develops the concept of distinguishing between living and non-living things by introducing the term 'once living' and 'products of living things'.

Begin by reading through the statement on the activity sheet: *'We use, see, touch, hear, smell and even taste a large number of living and non-living things every day. A living thing can be defined as something that is able to breathe, eat, drink, move, grow and reproduce'*.

What you need

Activity Sheet – Living and non-living things

Activity Sheet – Sorting living things

Extension activity

Old magazines

Internet access

This activity has been adapted from:

Corroboree Frog Education Kit. 2013. Wirraminna Environmental Education Centre, NSW.

Ask your class to determine whether a number of things are living or non-living? Look around the classroom or outside for obvious examples. When you get to an item made of wood (such as a table), focus on that item and point out that it is wood and it comes from a tree.

Is it living or non-living? You may get a mix of answers.

Does it breathe, eat, drink, move, grow and reproduce? The answers should be no.

Even though the wood item was once a living thing it is now non-living.

Non-living things can include things that were once living and products of living things. Go through some examples with students: wood, wool, feathers, hair, faeces etc.

Students should now complete **Activity Sheet – Sorting living things** by sorting the list into living and non-living things; identifying once living and products of living things; and thinking of three examples for each of the four categories.

Conclude activity by reinforcing that *‘a living thing can be defined as something that is able to breathe, eat, drink, move, grow and reproduce’*.

Extension: Similarities and differences

Separate the class into small groups. Each group gathers a range of plant and animal images, either from magazines or printed from the Internet. Groups lay these pictures separately, face up so the whole group can see all of them.

Ask students to discuss, within their groups, the similarities and differences between the living things. They need to divide the pictures into a maximum of six groups of what the students consider to be similar living things (things that have the most similarities or differences).

Students record the following for each living thing group:

1. Name of their living thing group
2. List the living things in the group
3. Identify the main similarity or difference – the reason those living things are in that group. This should be a characteristic (trait) such as ‘has wings’ or ‘has feathers’ rather than the type of species like ‘birds’.

Once completed, each group presents their living thing similarities and differences to the rest of the class.

Living and non-living things

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

Write some words describing properties of the things in each of the three circles. Think about the following properties:

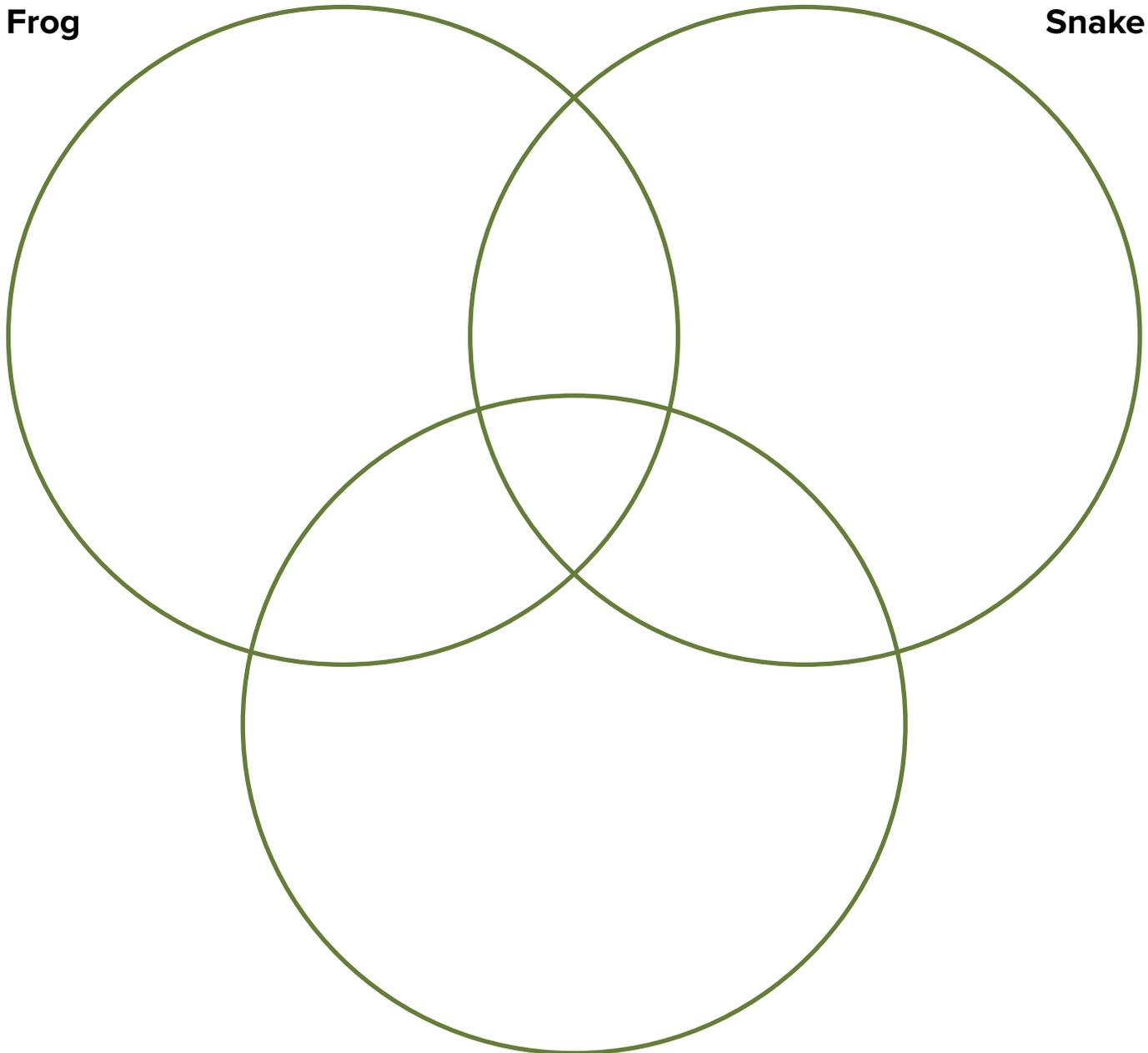
- does it drink, eat, grow, colour, reproduce, breathe
- shape, size and purpose
- where it is found
- what it is made of.

Do I have anything in common with a snake or telephone pole?



Frog

Snake



Telephone pole

ACTIVITY SHEET

1. Are there any similar properties in the overlapping areas between the Frog, Snake and Telephone Pole.

Shared Attributes	
Frog and Telephone Pole	
Snake and Telephone Pole	
Frog and Snake	
All three	

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.

Sorting living things

Everyday we use, see, touch, hear, smell and even taste a large number of **living** and **non-living** things.

A living thing can be defined as something that is able to breathe, eat, drink, move, grow and reproduce.

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

Carpet python • telephone pole • frog • woollen jumper • fishing rod • cow pat • goanna • TV antenna • kookaburra • wooden chair • Mum • brick • brolga • flour • dog • feather • pork chop.

Living things	Non-living things

2. 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

ACTIVITY SHEET

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

	Examples
Living	1. 2. 3.
Non-living	1. 2. 3.
Once living	1. 2. 3.
Product of a living thing	1. 2. 3.

Activity 1.2 Animal classification

Description

Students use a dichotomous key to classify animals based on their similarities and differences.

When classifying living things, scientists look at the species unique characteristics and group them based on their similarities or differences. For example, we have lots of frogs and these are classified into smaller groups based on their physical characteristics, such as being able to climb trees or burrow underground.

Introduction

Ask your students:

- Do you think that all things are the same?
- If things are not the same what would we say they are?

Scientists look at the *differences* in objects to help understand and identify them.

- [Student A] and [Student B] are both living, but are they the same?
- Even though they are different they are also... what?

Scientists also look at the *similarities* in objects to help understand and identify them.

When living things are classified, we can use tools like a 'dichotomous key' to help us know the right groups to put living things into.

'Dichotomous' means 'divided into two parts'. Dichotomous keys are a diagram that consist of branches showing a series of choices between two options that lead the user to the correct group or item.

Sketch a rough dichotomous key on the board to demonstrate the concept (just an outline with no labels). Then, show as you come down the initial line each junction provides a choice between two options. Continue drawing your lines on either side and show how each of those can come to a junction with a choice between two options. Continue your dichotomous key until you think the students have understood the concept.

What you need

Activity Sheet –
Dichotomous key

SLIDE 4

This activity has been adapted from:

Corroboree Frog
Education Kit. 2013.
Wirraminna Environmental
Education Centre, NSW.

Part A Create a classroom dichotomous key

Create a dichotomous key that can help sort the class into groups of similar students or even individuals.

On one side of your board, brainstorm with your students a list of possible choices (always with only two options per choice) that could be used to design a key to categorise all members of your class.

Focus on features such as:

- Boys or girls
- Dark hair colour or light hair colour
- Tall or short
- Long or short hair
- Glasses or no glasses
- Uniform or no uniform
- Freckles or no freckles
- Lives in town or doesn't live in town

Students will come up with a range of creative answers to sort their class. Be aware to edit out any suggestions that may cause offence to others.

Start your key with the word 'Class' in the top middle of the board. Draw a line down to the first junction/choice. Ask students what their first choice should be? Try and direct them to a broad choice like 'boys or girls' that should split the class in roughly two. Write the choice above the designated branch.

Ask students to divide into two groups indicated by the choice (boys/girls etc). Work through your other choices from the brainstorm list and keep dividing them into smaller and smaller groups. Make sure you label the choices as you expand the key.

You can keep dividing the groups as many times as you want. You could even use the whole classroom and divide until all individuals have been identified on your dichotomous key.

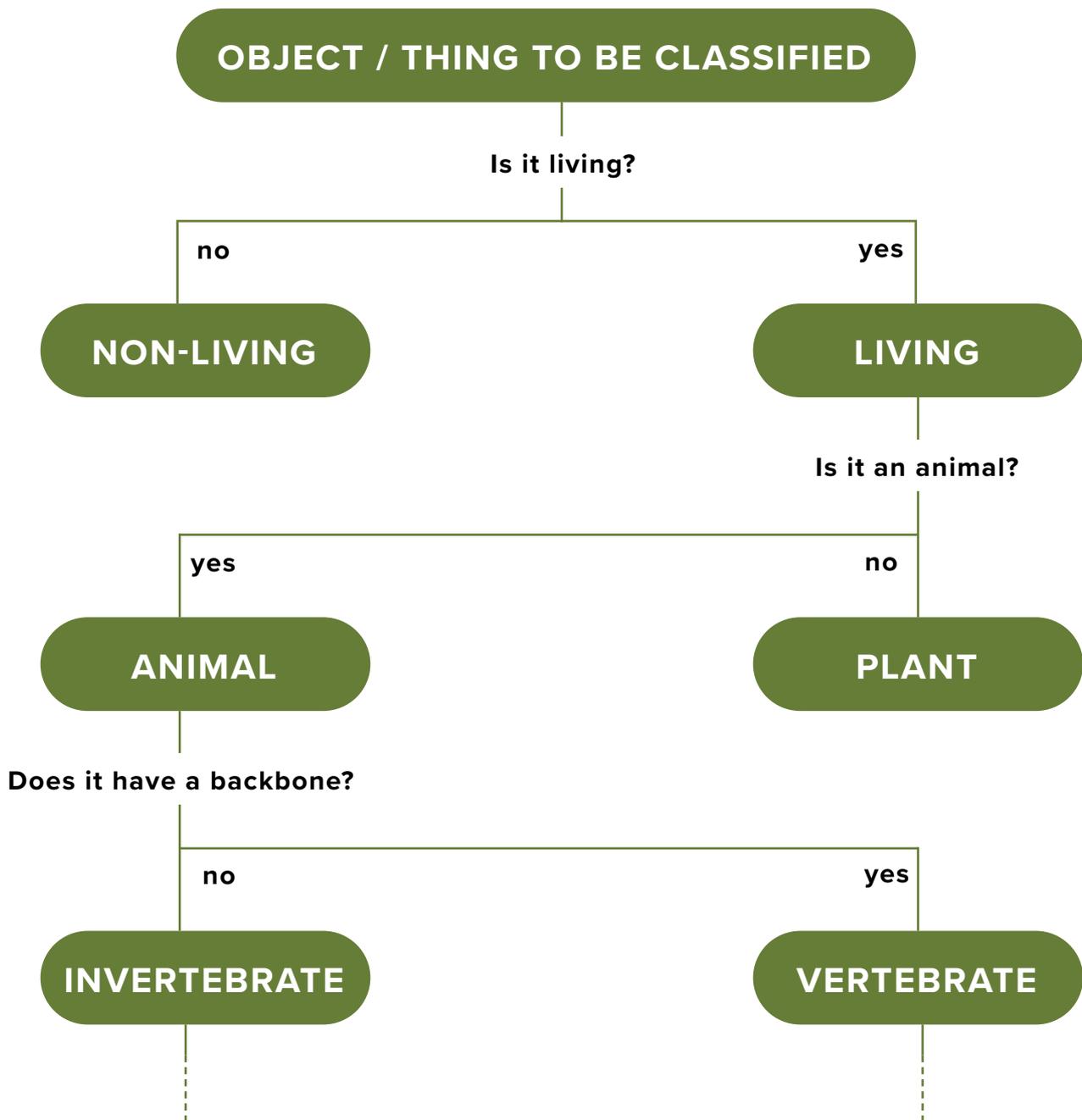
Part B Animal dichotomous key

Provide students with **Activity Sheet – Dichotomous key**. They will follow the instructions and use the information contained on **Slide 4 Frogs are vertebrates** of the interactive presentation to design a simple dichotomous key that identifies the five vertebrate groups.

Dichotomous key

The similarities and differences in animals help us to group similar types of animals together. This can help us identify individual species.

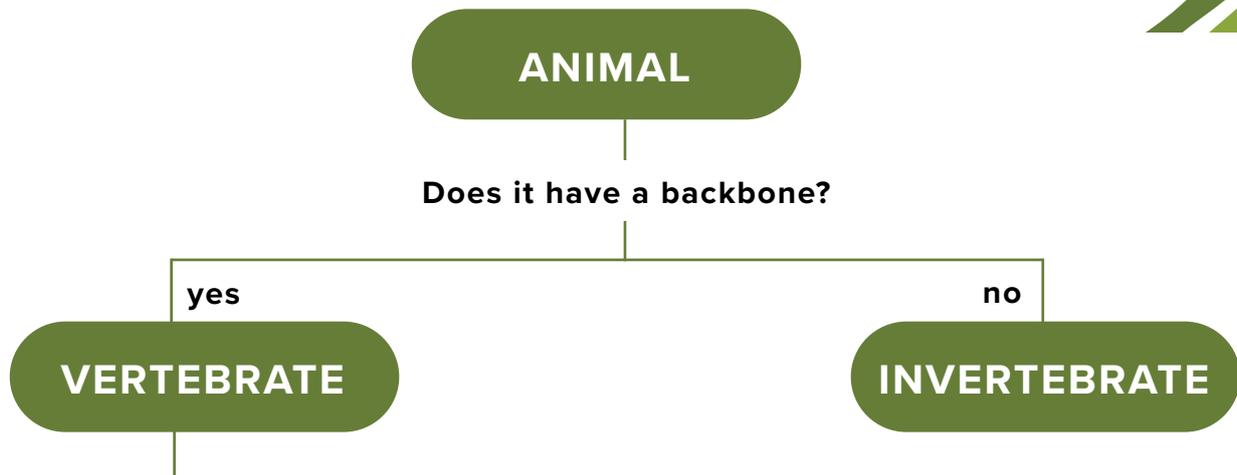
Scientists often classify animals using a tool called a **dichotomous key**. Dichotomous keys (pronounced *die-cot-o-mus*) are branched diagrams showing a series of choices between two options.



ACTIVITY SHEET

What am I?

Your task is to complete the dichotomous key until you have enough branches to identify the five main vertebrate groups. Use the information contained on Slide 4 and 5 of the interactive presentation to guide you.



Activity 1.3 What I know about frogs

Description

Provide students with **Activity Sheet – What I know about frogs**. Ask students to brainstorm what they currently know about frogs and write down short statements or words that describe their own knowledge. Have students record their own answers in a single colour pencil or pen. After approximately five minutes, students share what they know with the entire class and their contributions are written on the board for everyone to see. In a different colour pen or pencil, students then add any additional answers to their own onto their activity sheet.

Encourage students about this great start and the many things they know already. Tell them that they will learn even more exciting facts about frogs over the next days/weeks/months.

Ask your students:

- Have you seen many frogs?
- Have you heard many frogs?
- Where would you go looking for frogs?

This activity may be repeated to document the student's learning outcomes.

Extension: Craft a frog

Students design a three-dimensional model of a frog using material such as plasticine, play dough, bread dough, clay or papier mâché. Encourage students to think about the size, colour and physical features of frogs before they begin their creation. If students need extra support the diagram of **Activity Sheet – What I know about frogs** can be offered as a base. In small groups, students share their models and compare the different features of their frogs.

As a class discuss the reasons for particular frog features by asking questions such as these:

- Are all frogs green?
- Are all frogs the same size?
- Why do some frogs have patterns?
- Why are some frogs only a single colour?
- Why do some frogs have webbed feet?
- What covers a frog's body?

What you need

Activity Sheet – What I know about frogs

Different coloured pens

Plasticine, play dough, bread dough, clay or papier mâché



This activity has been adapted from:

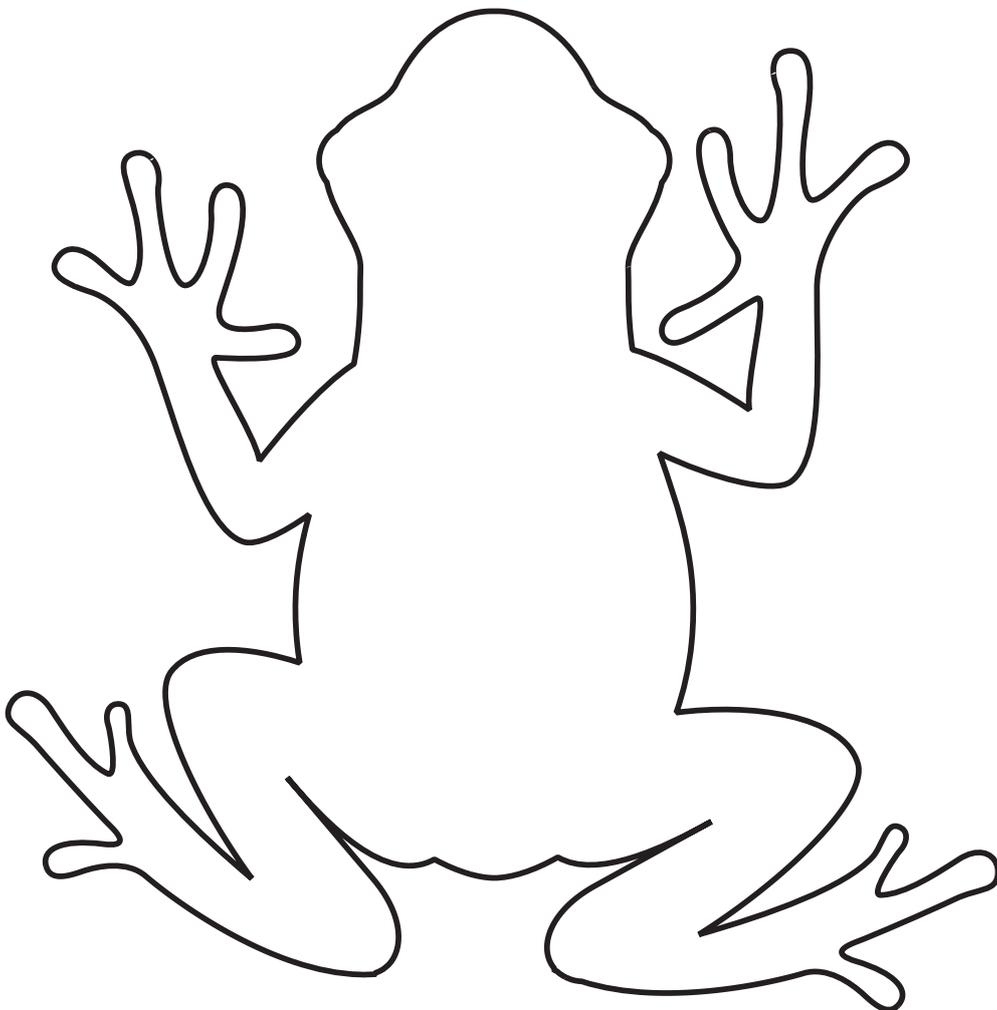
Saving the southern bell frog: An education resource for Years 3 to 6. 2018. State of NSW and Office of Environment & Heritage, NSW.



What I know about frogs



What do you know about frogs? Do you already know something about their shape, colour, size or where they live? Write what you know around the frog below.



Activity 1.4 Frog adaptations

Description

Students are introduced to the term adaptation and apply the term to help identify different frog features or characteristics and how these help them survive.

Introduce the term adaptations to your students. “*Adaptations identify features or characteristics that animals develop to help them survive.*”

There are two different forms of adaptations – physical and behavioural. Discuss the differences with your class. For example:

Behavioural adaptation – some animals are nocturnal (active at night) whereas others are diurnal (active during the day).

Physical adaptation – some animals hibernate to escape the coldest part of the year. Some animals are active hunters, whereas others use a sit-and-wait strategy.

Brainstorm, as a class or in small groups, the range of adaptations frogs could have. How could these adaptations assist the frog’s survival? Which ones are behavioural and which ones are physical adaptations?

Follow this up by exploring the various frog adaptations from **pages 15-17**. Provide them with **Activity Sheet – Frog adaptations** to help identifying and describing important frog features and their functions. Show **Slide 6 Frog adaptations** from the interactive presentation.

Below is a list of other frog adaptations.

- Different frog species call at different times of the year
- Some frogs call during the day and others call during the night
- Some frog species burrow in the soil
- Only male frogs make mating calls
- Most frogs lay lots and lots of eggs at a time
- Frogs are well camouflaged
- Some frog species can change colour
- Some frog species have bright colours

Students choose one frog adaptation and present it as a drawing/ painting, poster, animation, or in another format that helps explain how it assists a frog’s survival. For example: Frogs lay hundreds of eggs but not all of these eggs will survive. This could be presented by a picture of the eggs and what might happen to them.

What you need

Activity Sheet – Frog adaptations

Paper

Pens and coloured pencils

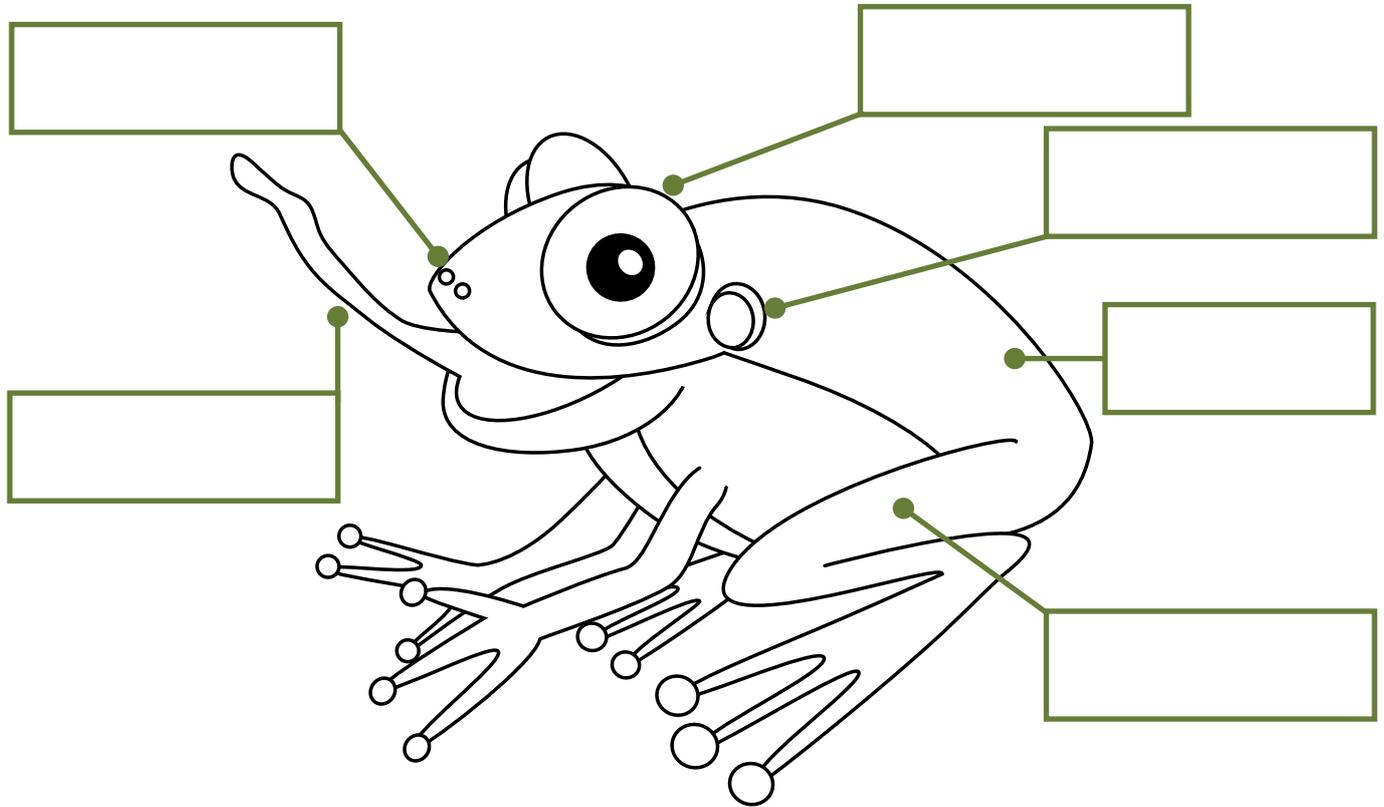
SLIDE 6

This activity has been adapted from:

Corroboree Frog Education Kit. 2013. Wirraminna Environmental Education Centre, NSW.

Frog adaptations

1. Fill in the adaptations on the frog diagram. Name the special features of a frog and how they help the frog to survive.



2. How do frogs breathe underwater?

.....

3. What is another name for a frog's ear?

.....

4. What do frogs use to detect their food?

.....

5. What is the difference between a frog and a human tongue?

.....

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

.....

7. Why do frogs blink when they swallow their food?

.....

Activity 1.5 Life cycle of a frog

Description

Students are introduced to animal life cycles and the term 'metamorphosis'. They investigate the stages of a frog's life cycle.

Introduce students to the term 'life cycle'. Ask them what they think it means. Every living organism has a life cycle of birth–reproduction–death. Think of your own life cycle: we are born, we grow up, we may have children, we get old and we die.

Frogs have a similar life cycle overall, but some aspects are extremely different. Frogs go through a process called *metamorphosis*. This means that they change how they look and function by transforming from a tadpole, that lives and breathes underwater through gills and has a tail to swim like a fish – to a frog, that lives on land, uses lungs to breathe and strong legs to move around. Other animals that go through metamorphosis include maggot to fly, caterpillar to butterfly, freshwater salmon to saltwater salmon.

Students complete **Activity sheet – Life cycle of a frog**. Go through the life cycle stages on **Slide 8 Life cycle of a frog** of the interactive presentation, you can also provide copies of **Page 12** of this resource to your students for extra detailed information.

Extension: Life cycle film strip

Provide students with a copy of **Activity Sheets – Life cycle film strip A and B**. Students cut out the jumbled frog life cycle stages of film strip A and glue each stage of a typical frog's life cycle in order onto film strip B. The correct order is: male frog vocalising, male and female frogs in amplexus, spawn, tadpole, tadpole with back legs, tadpole with front legs, frog with tail and adult frog. Thread the film strip through the box, form it into a circle and glue the ends together. Students verbally share their frog life cycle film strip and explain each stage of a typical frog's life cycle with a student from another grade.

Extension: Life cycle poem

Read the poem "Changes" by Jill Brasell with your class. Students identify the different changes typical for a frog's life cycle while working through the poem, using the **Activity Sheet – Life cycle poem**.

Extension: Life cycle quizzes

Students can have fun working through the quizzes on **Activity Sheet – Life cycle quizzes**.

What you need

Activity sheet – Life cycle of a frog

Extension activities

Activity sheet – Life cycle film strip A

Activity sheet – Life cycle film strip B

Matchbox or a small box with a lid

Scissors

Glue

Activity Sheet – Life cycle poem

Highlighters or coloured pencils

Activity Sheet – Life cycle quizzes

SLIDE 8

This activity has been adapted from:

Frogwatch Schools Education Kit. 2009. Ginninderra Catchment Group, ACT.

Life cycle of a frog

What does the term 'metamorphosis' mean?

.....

Frogs go through the process of metamorphosis. Name another two animals that go through metamorphosis.

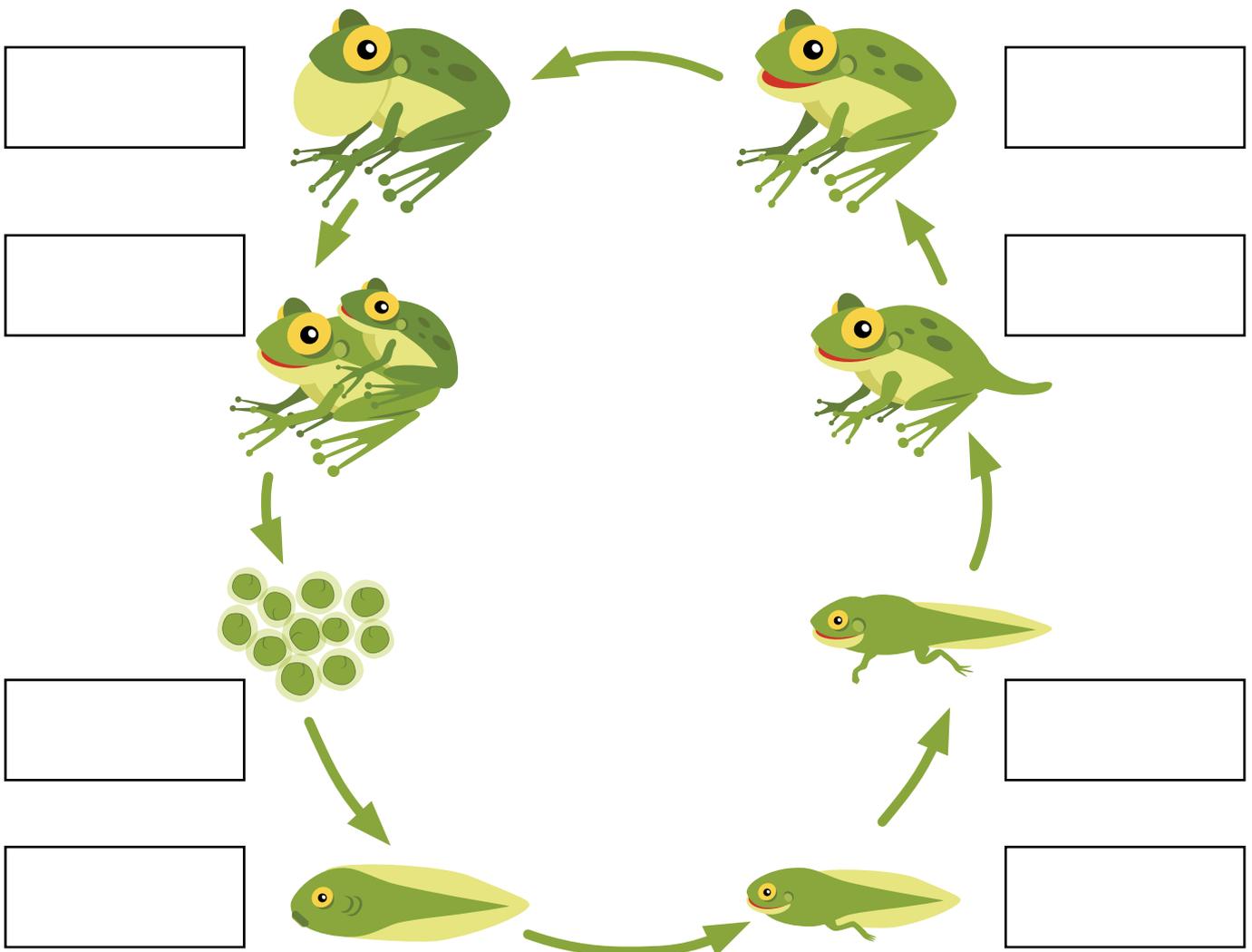
.....

The following terms describe the stage of a frogs life cycle. Put them in correct order on the diagram below.

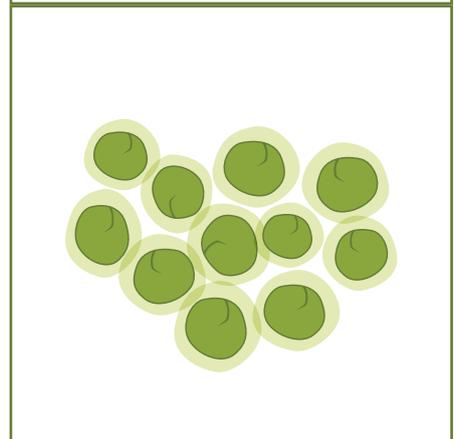
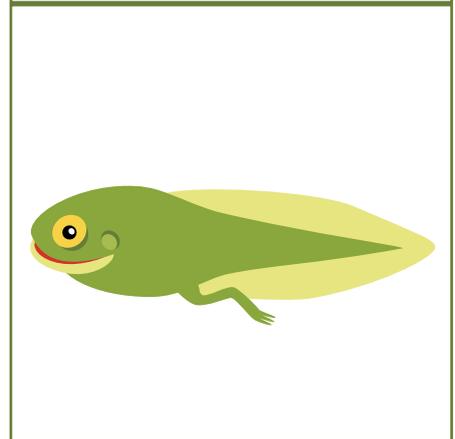
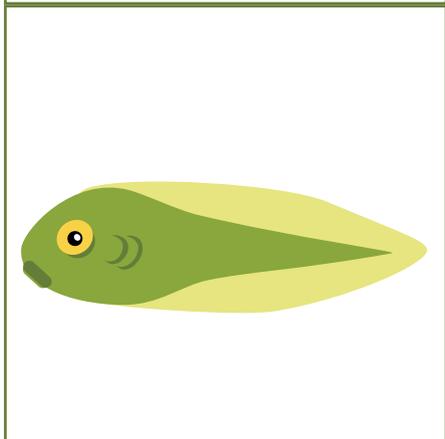
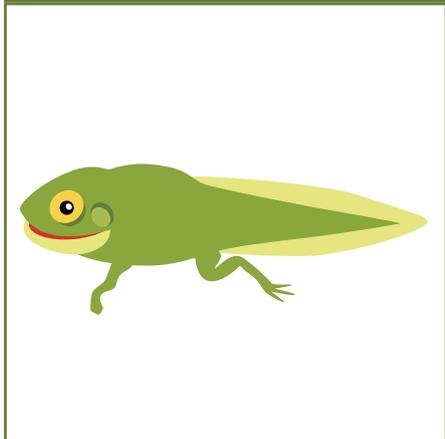
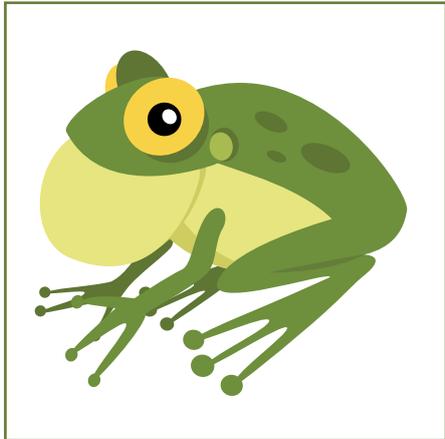
male frog vocalising
adult frog
spawn

tadpole with back legs
male and female frogs
in amplexus

tadpole
frog with tail
tadpole with front legs



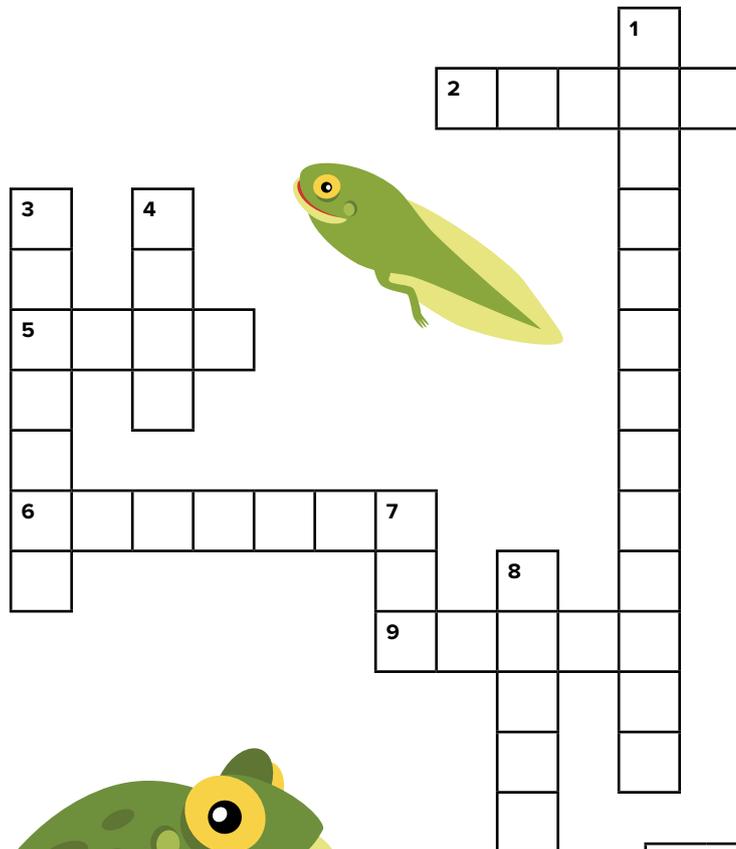
Life cycle film strip A



Life cycle film strip B

Life cycle quizzes

Fill in the crossword to check if you can solve all nine clues and see how many words you can find in the word search below



Across

- 2. Where do frogs lay their eggs?
- 5. Frogs use this to breathe.
- 6. A baby frog.
- 9. Tadpoles use these to breathe.

Down

- 1. The changing from tadpole to frog.
- 3. Frogs like eating these.
- 4. Tadpole swim with it.
- 7. Frogs are born in it.
- 8. Tadpoles like eating them.



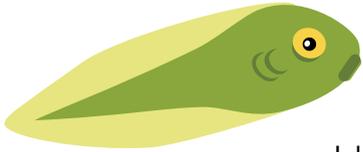
Find these frog life cycle words.

- arms
- change
- eggs
- frog
- froglet
- gills
- grow
- land
- legs
- lungs
- pond
- tadpole
- tail
- water

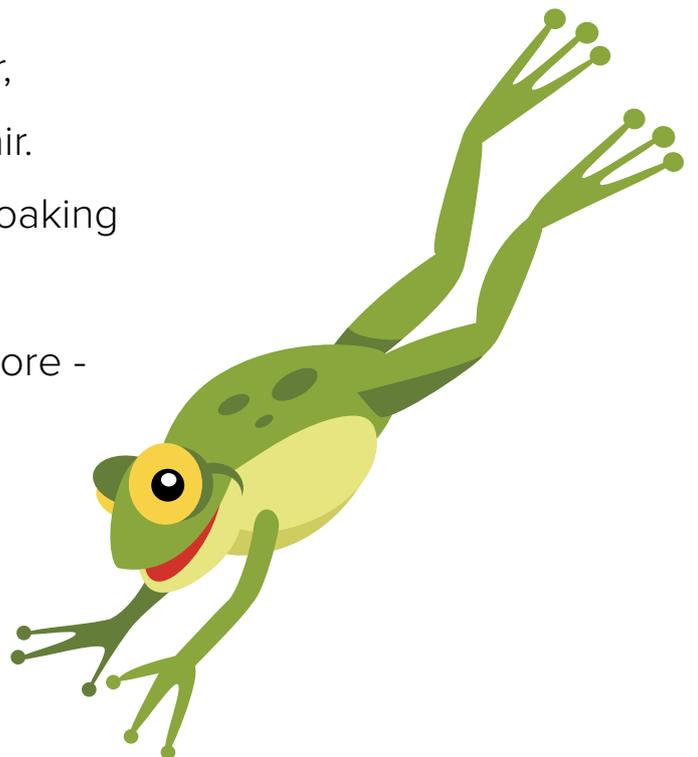


Life cycle poem

Read the poem **Changes** by Jill Brasell. Try to identify the different changes typical for a frog's life cycle and mark them with a highlighter in the text.



I haven't felt so funny
Since the day we left our eggs.
Some bumps are growing near my tail,
They really look like legs.
Well, legs are good for swimming
And flippers have their charms,
But what's this coming through my
chest?
This time I'm getting arms.
I'm a funny sort of tadpole,
My tail is hardly there.
I used to gulp the water,
But now I'm breathing air.
It makes me feel like croaking
As I sit upon this log.
I'm not a tadpole any more -
I've turned into a frog!



2. COROWA'S LOCAL FROGS

Overview

The following activities aligns with **Section 2 – Corowa's local frogs** of the interactive presentation and the background knowledge on **pages 8, 20-29**. These activities introduce students to the species of frogs from the Corowa region and how we can identify them by their calls.

Activities

- 2.1 Our local frogs** – Students reflect on what they have learnt so far by playing 'Heads Down, Thumbs Up'.
- 2.2 Doogalook the frog** – Students learn a local Dreamtime story and how Dreamtime stories either tell about the creation of life or impart life lessons.
- 2.3 How do they croak?** – Students learn how frogs croak and how to decipher the differences between eight frogs from the Corowa district.
- 2.4 Finding a mate** – Students learn that each frog species has its own unique call.
- 2.5 Investigating the Sloane's Froglet** – Students conduct an investigation into the Sloane's Froglet, looking at their physical characteristics.



bit.ly/HopIntoFrogs

Stage

Stage 2 to 3

Syllabus outcomes

Science

ST2-4LW-S

ST3-4LW-S

HSIE – History

HT2-2, 3

English

EN2-10C

Visual Arts – Music

MUS2.1, 2.2, 2.4

MUS3.1, 3.2, 3.4

VAS2.1, 2.2, 2.4

Cross-curriculum priorities

Aboriginal and Torres Strait Islander histories and cultures

Sustainability

General capabilities

Literacy

Critical and creative thinking

Background knowledge

Pages 8, 20-29

Interactive presentation

Section 2 – Corowa's local frogs

Activity 2.1 Our local frogs

Description

Students reflect on what they have learnt so far by playing 'Heads Down, Thumbs Up'.

Students sit with their heads on the table, eyes closed, and make a 'thumbs up' action to what they believe are true statements, or a 'thumbs down' action to false statements.

Statements to test student recall can include but are not limited to:

1. Frogs are important for our environment – Y
2. Frogs give birth to live young – N
3. Frogs have fur – N
4. Frogs are vertebrates – Y
5. All frogs have a tail – N
6. Frogs go through metamorphosis – Y
7. Tadpoles eat fish – N
8. Carnivores are meat eaters – Y
9. All frogs are green – N
10. Wetlands are important ecosystems – Y
11. Frogs eat insects – Y
12. Frogs are amphibians – Y
13. Frogs can change colour – Y

What you need

List of yes/no questions about frogs

This activity has been adapted from:

Frogwatch Schools Education Kit. 2009. Ginninderra Catchment Group, ACT.

Activity 2.2 Doogalook the frog

Description

Students learn a local Dreamtime story and how Dreamtime stories either tell about the creation of life or impart life lessons.

Write Dreamtime on the board. Brainstorm what might this word mean.

What can Dreamtime stories teach us?

Ask students if they were told a story to explain something by their parents/grandparents. For example, how lightning occurs or finding Yowies in rivers, etc.

Why do we have stories like these?

Read **Doogalook the frog**, a Bpangerang Dreaming story (page 8).

What is the message in this story?

(Those who are respected will always be remembered)

Read the story a second time to see if students can hear the message.

What type of frog makes a 'Doogalook' sound?

The frog in this story is an Eastern Banjo Frog. Use the following activities to help students learn more about the Eastern Banjo Frog, and other local frogs, their sounds and interesting characteristics. Students should be encouraged to write a story, poem, song about their frog.



Extension: Tiddalik the frog

Students are asked to read the Dreamtime story of Tiddalik the frog – your school library will have a version of this story. They need to write down what the message is in the story. As a class, discuss what type of frog it could be based on the characteristics described in the story.

What you need

Doogalook the frog story – page 8

Copy(s) of a book about Tiddalik the Frog, such as:

- *What made Tiddalik laugh?*
- *Tiddalick the frog who caused a flood*
- *Tiddalick, the greedy frog*

Activity 2.3 How do they croak?

Description

Students learn how frogs croak and how to decipher the differences between eight frogs from the Corowa district.

Begin this activity by asking students how they think a frog croaks.

Frogs croak by moving air over their vocal cords and causing them to vibrate. To amplify this sound they make use of the sack at the bottom of their mouth. This sack can stretch out like a balloon and a frog can use this to make the sound they make stronger. Amplifying allows for the sound to travel long distances.

Demonstrate this description using a balloon. Blow it up and then release the balloon without applying any stretch to the mouth piece. Ask students how loud this was and can we change the sounds being made. Blow up the balloon again and this time stretch the mouth piece to slowly release the air and vibrate the mouth piece. Ask students how different the sound was and that we could make a variety of noises. This is just like the vocal chords on a frog. Each frog has a different call that is unique to them. This is how we can identify different frogs.

Provide students with **Activity Sheet – My frog call dictionary**. They will use this sheet to create their own frog call inventory as you run through **Slide 11 Frogs around Corowa** and **Slide 16 What does a Sloane's Froglet sound like?** of the interactive presentation.

Using the interactive presentation, students carefully listen to the calls of eight frog species that can be heard in our local wetlands during their breeding season. They need to record on their activity sheets what they think it sounds like using sounds they are familiar with – for example knocking on a door, a motorbike, a witch's laugh, a dog barking etc.

Extension: Corowa frog chorus

Using the frog call dictionaries, each student is assigned a frog call. Group some frogs together so that students can practice as a group. Once ready, all students sing their frog calls together, just like a wetland after it rains. Precision of the call is more important than volume.

Extension: FrogID

Get students involved in the Australian Museum's FrogID Project. The FrogID app is used to record and identify frog calls across Australia. If you have frogs around your school, you can take part in their school activities. FrogID has a series of resources available online to support teaching and learning about frogs. Visit: www.frogid.net.au/schools.

What you need

Activity Sheet – My frog call dictionary

Frog call recordings

SLIDES 11 & 16

This activity has been adapted from:

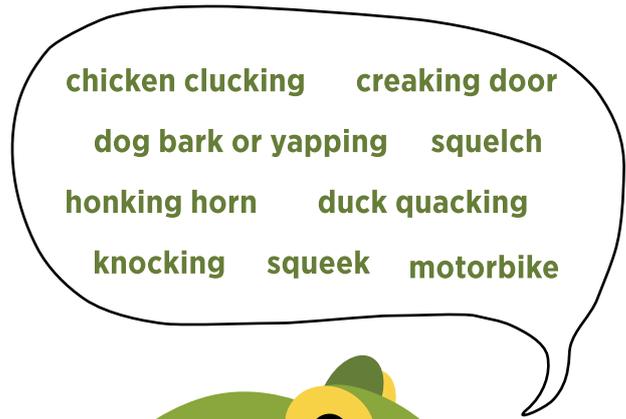
Saving the southern bell frog: An education resource for Years 3 to 6. 2018. State of NSW and Office of Environment & Heritage, NSW.

My frog call dictionary

We don't always **SEE** frogs, but we can **HEAR** them.

You are going to make your own frog call dictionary by describing what you think these eight frogs sound like.

Use sounds you are familiar with. Murray Frog has a few ideas to get you started.



Common Eastern Froglet

Crinia signifera

A small frog
20-30mm long.

Sounds like:

.....



Eastern Sign-bearing Frog

Crinia parinsignifera

A small frog
20-30 mm long.

Sounds like:

.....



Eastern Pobblebonk Frog

Limnodynastes dumerilii

A medium to large frog
55-85mm long.

Sounds like:

.....



Giant Banjo Frog

Limnodynastes interioris

A large burrowing frog
60-90 mm long.

Sounds like:

.....



Spotted Grass Frog

Limnodynastes tasmaniensis

A small to medium frog
35-45 mm long.

Sounds like:

.....



Peron's Tree Frog

Litoria peronii

A medium to large frog
45-65 mm long.

Sounds like:

.....



Sudell's Frog

Neobatrachus sudelli

A medium to large burrowing
frog 50-65mm long.

Sounds like:

.....



Sloane's Froglet

Crinia sloanei

A small frog
15-20 mm long.

Sounds like:

.....

Activity 2.4 Finding a mate

Description

Students learn that each frog species has its own unique call.

Use the frog calls on **Slide 11 Frogs around Corowa** of the interactive presentation for this activity.

Background

The male frog has a vocal sac to make sounds when he wants to advertise that he is ready to mate. Following these sounds, all interested females of the same species are able to find him. The louder a male frog calls the more attractive he is for a female frog. But calling loudly is also risky for a male frog as he might not only attract a female frog but also predators, such as snakes, that would like to eat him.

The calls of two different species might sound alike to us, but very different to the frogs. Frogs have much better ears than humans and can detect even very slight differences in pitch and frequencies of sounds. Scientists use electronic testing equipment to create a sonogram of the calls, which graphically show the differences that are too subtle for our ears to distinguish.

One student is taken outside the classroom. All other students stay inside the classroom, positioned around the perimeter of the class (an open space is best) and each student receives one of the frog cards. It is best to prepare the cards to have pairs for each species. Students have to memorise the call of their assigned frog so that they can emit that call a little later – they are the male frogs!

The student outside the classroom is the female frog and she must find her mate in a pond full of different frog species. The female frog also has to memorise the frog call from the card given to her. Important: Only one card in the classroom set matches the female frog card!

The female frog is then blindfolded and taken back into the class and left in the centre of the room. On an arranged signal all male frogs start calling at once to imitate a frog chorus, using the calls on their cards. The task of the female frog is to listen carefully and locate the student/male frog making the exact call as it described on her card.

There are a number of variations to this activity:

- Have two students blindfolded and listening for the same frog call. See who gets there first. This demonstrates the competition between rival females.

What you need

Cards with frog-call descriptions for all eight local species. Minimum of 2 cards per species. Use *Activity Sheet – My frog call dictionary* to create your cards.

Extension activity

Variety of materials that may increase the volume of a sound, such as polypipe, different sized cardboard tubes, funnels, boxes, buckets, cups, their hands, empty tins, yogurt containers, paper bags etc.

SLIDES 11 & 17

This activity has been adapted from:

Frogwatch Schools Education Kit. 2009. Ginninderra Catchment Group, ACT.

- Have two students blindfolded, listening for the same frog call and calling the desired call as well. This demonstrates that if both males and females vocalise, then female frogs would get attracted to the call of other female frogs and would have a hard time to find a mate.
- Have one student blindfolded and several potential mates around the circle vocalising the same call in different volumes. This demonstrates that the loudest call is the most likely to be heard. As in nature, the loudest frog often gets the most mates.
- Have eight students outside with a set of cards, each one representing one different frog call. These students are the females and they each learn their call. Once they are confident that they can each memorise their call, they return back to the classroom, where the rest of the class, the male frogs, desperately call. They need to find their mate amidst the cacophony of calls. This demonstrates the difficulty in finding a partner amongst the volume of the calls.

Do the same as above but have the calling male frogs walk around the classroom while calling. This shows that it is much harder to find a moving target than a stationary one.

Extension: I'm the loudest

Using a variety of materials, challenge students to increase the volume of their frog call. This can be as simple as blowing through a cardboard tube. Have a range of materials available to choose from. Use polypipe, different sized cardboard tubes, funnels, boxes, buckets, cups, their hands, empty tins, yogurt containers, paper bags etc. Question students about why some frogs have been known to call from within drain pipes (to increase the volume of their call).

How can females hear a male call amongst a deafening frog chorus?

Females have finely tuned ears so they only hear sound at or near the sound frequency with which males of their own species call.

Frogs have a vocal sac that helps to make their call extra loud!

Play the audio recording of a male Common Eastern Froglet (*Crinia signifera*) calling for a mate.

Frogs have a number of different calls, but their mating call is the most obvious and easiest to hear. They can also make threat calls to other frogs and alarm calls when they are threatened.

Extension: Sloane's Froglet Song

Listen to the song on **Slide 17 Sloane's Froglet Song** of the interactive presentation.

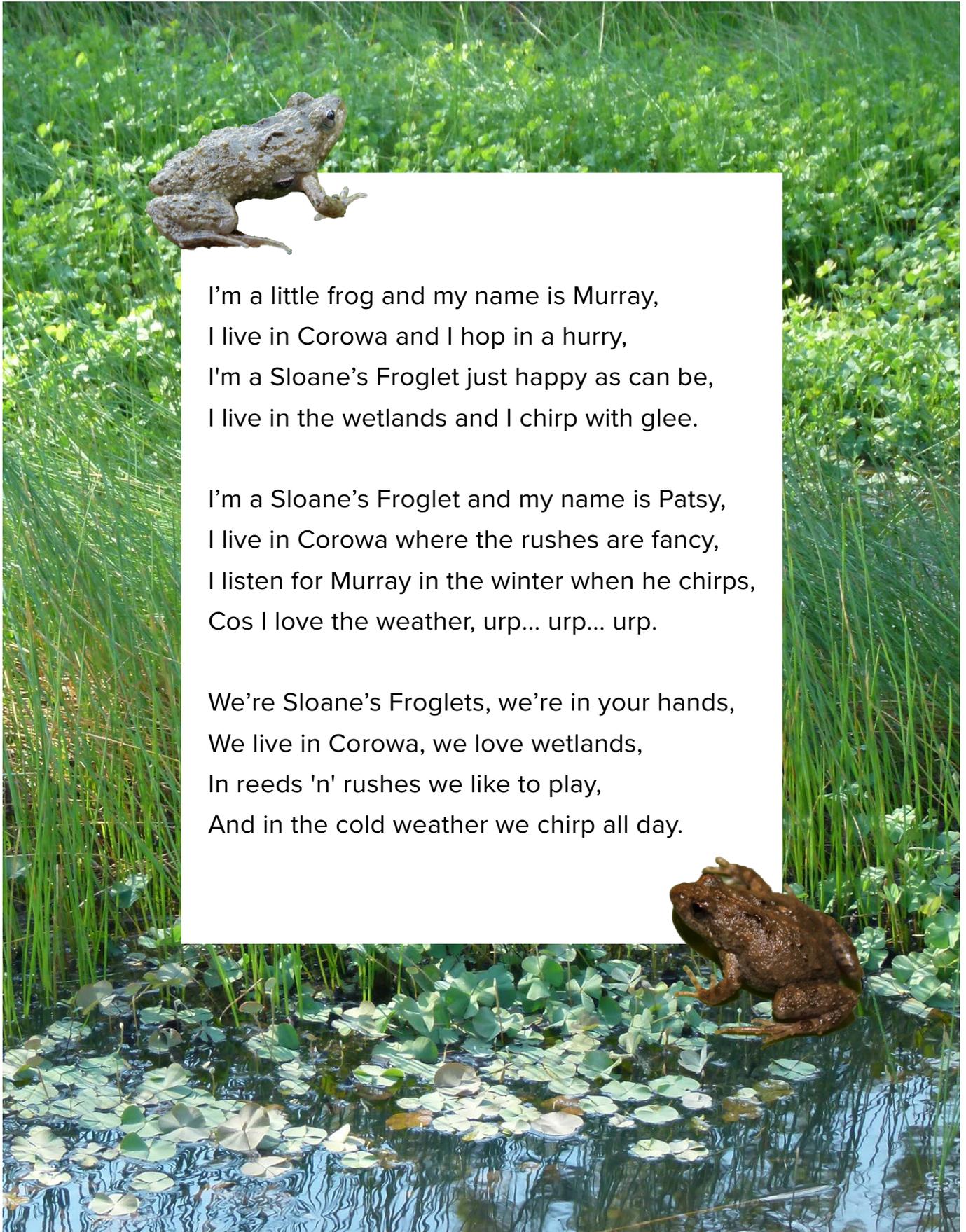
This song has been written by Dr. Alexandra Knight about the Sloane's Froglet found in the Corowa region. The song is sung by Corowa South Public School students and, using the lyrics, have the class sing along. Ask students to identify characteristics of the Sloane's Froglet in the song. These can include:

- They hop
- They're quick
- They live in wetlands
- They live in Corowa
- Males call out a lot in winter
- Male calls sound like urp, urp, urp
- They need our help

The names of the frogs in the song reflect the frog's discoverers - Murray and Patsy Littlejohn. Murray and Patsy identified the Sloane's Froglet in 1958 and named it after Patsy's uncle, Ian Sloane.

Creative students may like to write their own song about a frog or a wetland. Try using a familiar song as the musical component and then create the lyrics to fit the melody.

Sloane's Froglet song



I'm a little frog and my name is Murray,
I live in Corowa and I hop in a hurry,
I'm a Sloane's Froglet just happy as can be,
I live in the wetlands and I chirp with glee.

I'm a Sloane's Froglet and my name is Patsy,
I live in Corowa where the rushes are fancy,
I listen for Murray in the winter when he chirps,
Cos I love the weather, urp... urp... urp.

We're Sloane's Froglets, we're in your hands,
We live in Corowa, we love wetlands,
In reeds 'n' rushes we like to play,
And in the cold weather we chirp all day.

Activity 2.5 Investigating the Sloane's Froglet

Description

Students conduct an investigation into the Sloane's Froglet, looking at their physical characteristics.

Part 1

Immerse the students in background knowledge of the threatened species, Sloane's Froglet. Provide students with a print-out of the **Sloane's Froglet fact sheets (see pages 20-22)**. Go through **Section 2 Corowa's local frogs – Slides 12-16** of the interactive presentation to see more images and listen to Sloane's Froglets calling.

If possible, arrange for a workshop with someone who can talk more about Sloane's Froglets, or participate in a field trip to a nearby wetland where Sloane's Froglets are known to be found. Contact Corowa District Landcare for advice: admin@corowalandcare.com.au

Use **Activity Sheet – Our local frogs** to assist students with gathering information about the Sloane's Froglet and to practise drawing the Sloane's Froglet.

Part 2

Using an enlarged copy of a photograph as a drawing guide, or the examples on page 66, draw a outline on art paper. encourage students to draw a large outline of a Sloane's Froglet on art paper, even though they are actually very tiny.

Use a black oil pastel or black Sharpie to emphasise outline. Add other detail and colour using coloured pencil or oil pastel.

Fill in background to reflect the Sloane's Froglet habitat. Encourage students to check for "balance" in their artwork – if they can place their hand anywhere on their artwork without touching detail, maybe consider adding more detail in that area. Examples of student artwork are located on page 67.

Assessment: Ask students to record how they created their artwork and what they felt they achieved.

NOTE: This activity can be used for any of the frogs identified in this resource.

What you need

Activity Sheet – Our local frogs

Print-out of Sloane's Froglet fact sheets (pages 20-22)

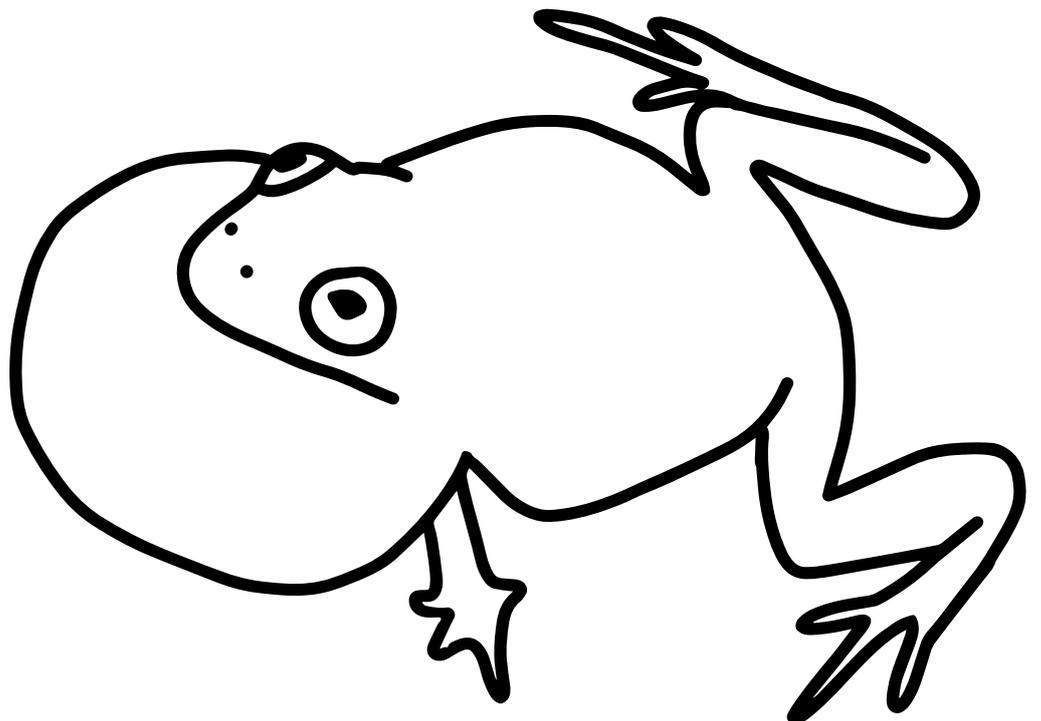
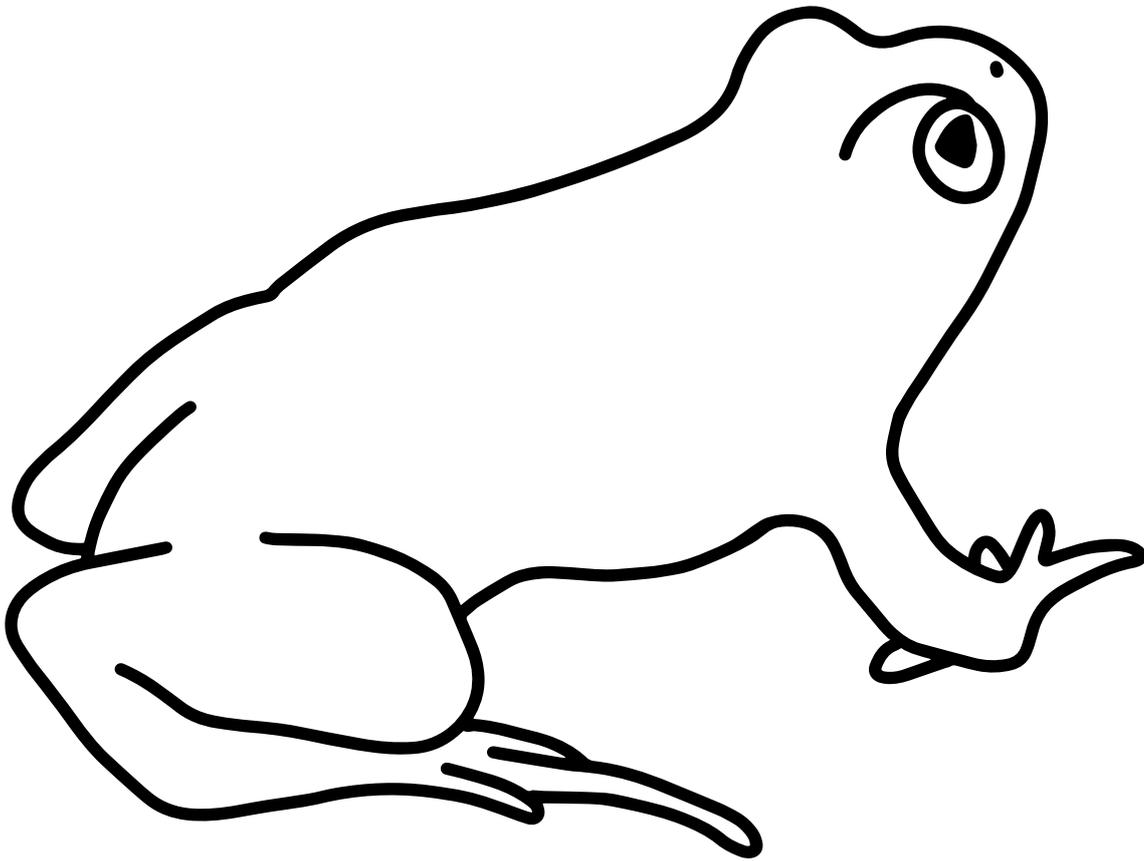
SLIDES 12-16

This activity has been adapted from:

Sloane's Froglet Artwork.
2018. Lee McDonald from Corowa South Public School.

Saving the southern bell frog: An education resource for Years 3 to 6.
2018. State of NSW and Office of Environment & Heritage, NSW.

Examples of Sloane's Froglet outlines



Examples of student artwork



Our local frogs

Answer these questions for the frog you have chosen.



My frog is the:

How big is it?

.....

Does it have any special features?

.....

What does it sound like?

.....

.....

.....

What does it eat?

.....

Where does it live?

.....

What colour is it?

.....

.....

.....

Draw your frog

3. LOCAL FROG HABITAT

Overview

The following activities aligns with **Section 3 – Local frog habitat** of the interactive presentation and the background knowledge on **pages 30-32**. These activities introduce the term 'habitat' to students, what it means to be part of your habitat and the kinds of frog habitats that can be found around the Corowa region.

Activities

- 3.1 Frog habitats** – Students are introduced to the term 'habitat' and the habitat requirements of frogs around Corowa and districts.
- 3.2 Frogs in a food chain** – Students are introduced to the term 'food chain' by connecting what frogs eat, to what eats frogs.
- 3.3 Wetland mural** – Students use art to re-create a wetland scene for their classroom.

Stage

Stage 2 and 3
(Years 3–6)

Syllabus outcomes

Science

ST2-4LW-S
ST3-4LW-S

HSIE – Geography

GE2-1
GE3-1

Visual Arts

VAS2.2
VAS3.1, VAS3.2

Cross-curriculum priorities

Sustainability

General Capabilities

Literacy

Personal and social capability

Background knowledge

Pages 30-32

Interactive presentation

Section 3 – Local frog habitat



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Activity 3.1 Frog habitats

Description

Students are introduced to the term 'habitat' and the habitat requirements of frogs around Corowa and districts.

Begin by asking the class the following:

- Where do you live?
- Where do you sleep?
- Where do you get your food?
- Where do you get your water?
- Where do you spend your days?

Inform students that all of these locations are your *habitat*. It is where you live, where you find nourishment, places you use or visit on a daily basis. An animal's habitat is no different. It is a place to hide from predators, feed, drink, breed and sleep.

Using **Activity Sheet – Frog habitats**, have students discuss the habitat requirements of a frog and write their answers on the lily pads.

As a class, run through **Section 3 Local Frog Habitat** of the interactive presentation (Slides 19-23).

Divide the class into seven groups - one for each of the key Corowa frog habitats. In their groups, students discuss the features that makes their habitat suitable for frogs. Each student creates their own A4 poster on their frog habitat. The poster should include:

- Habitat name
- Habitat features that frogs need
- Picture of their habitat
- Where they might find their habitat around the region

Extension: Sloane's Froglet habitat

Provide students with a copy of (or access to) the **Sloane's Froglet fact sheets** (pages 20-22). Students review the specific habitat requirements of the Sloane's Froglet and create a digital story of where Sloane's Froglets can be found, their water requirements, the types of vegetation they like to live in/around etc. Students can create their story using a variety of digital storytelling apps such as Adobe Slate, Adobe Voice, Book Creator for iPad, Creative Book Builder and StoryKit.

What you need

Activity Sheet – Frog habitats

Wetlands and habitats around Corowa (pages 30-32)

Paper and pens

Extension activity

Sloane's Froglet fact sheets (pages 20-22)

SLIDES 19-23

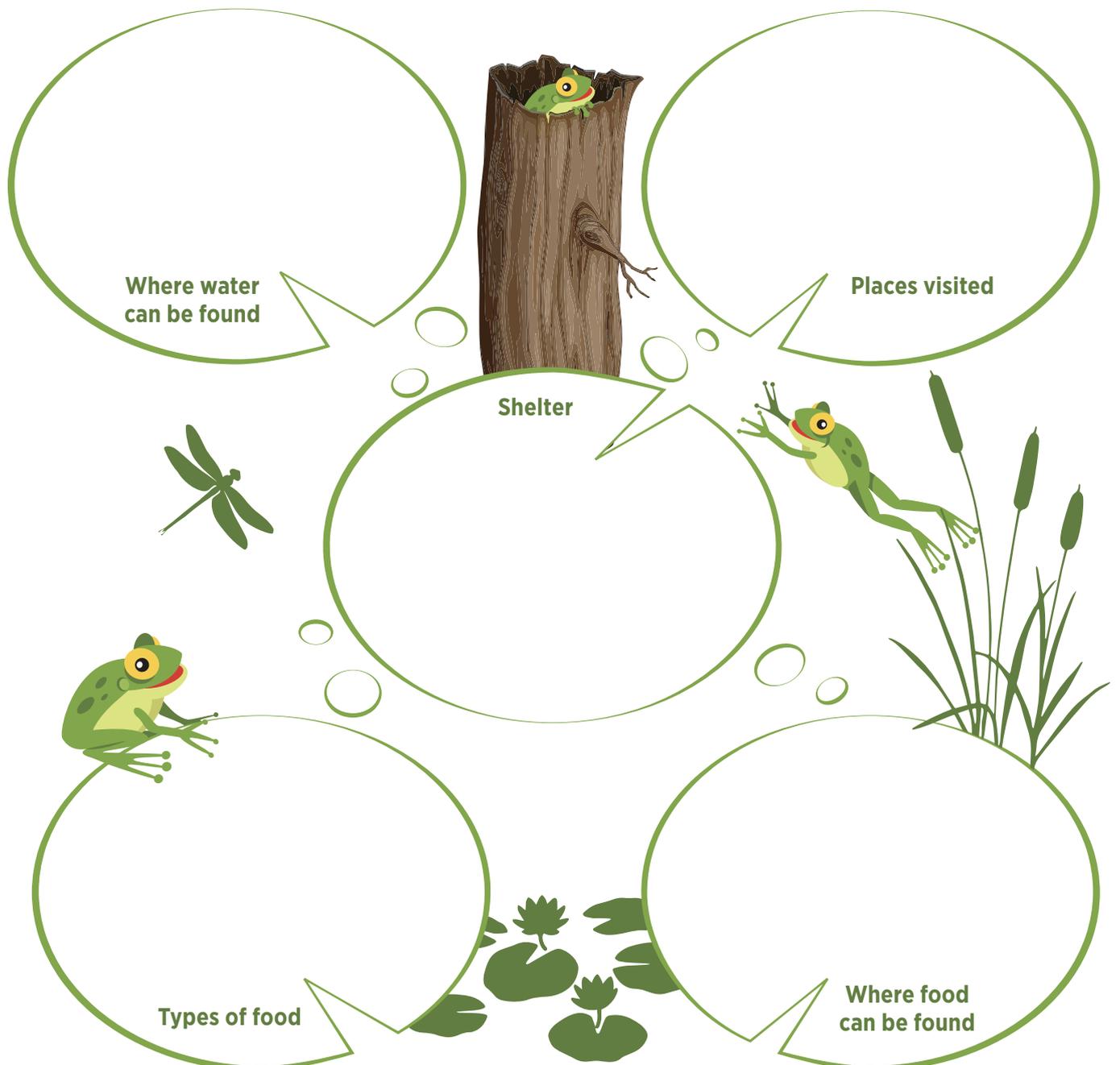
This activity has been adapted from:

Saving the southern bell frog: An education resource for Years 3 to 6. 2018. State of NSW and Office of Environment & Heritage, NSW.

Frog habitats

An animal's habitat includes all the places an animal lives in and uses to survive day-to-day. For example, animals need a place to hide, feed, drink, breed and sleep. Think about where you live, get food and water, spend your time during the day and go to on weekends. All these areas are your habitat.

Imagine you are a frog and you live in a wetland. Where would you sleep and find food? Do you move to other wetlands or travel in streams? Write your answers in the lily pads to describe your froggy habitat.



Activity 3.2 Frogs in a food chain

Description

Students are introduced to the term 'food chain' by connecting what frogs eat, to what eats frogs.

What you need

Activity Sheet – Frog food chains

Background

This activity is targeted at Stage 3 students. It provides a brief introduction into scientific concepts covered in the NSW Stage 4 syllabus.

Frogs are an integral part of many ecosystems such as wetlands, forests and even deserts. They play a role in controlling invertebrate populations, and they provide food for a large number of other animals, such as snakes, lizards, fish and birds.

Frogs rely on freshwater aquatic (water-based) habitats for their survival and they are an important indicator species for when these habitats change, whether it be by pollution, development or climate change.

SLIDE 20

Description

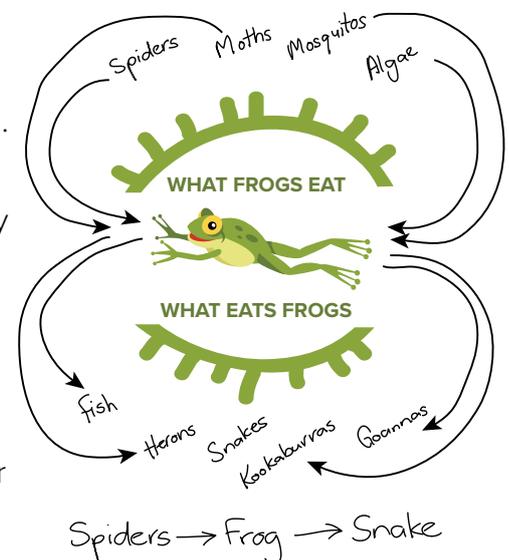
Conduct two brainstorms – What Frogs Eat and What Eats Frogs. Get students to identify as many organisms as they can.

Introduce students to the term 'food chain'. A food chain shows us how organisms relate to each other by the food they eat.

Food chains show links between who eats what. We use arrows between these organisms to show where the energy flows. For example: The sun provides energy to plants, plants provide energy to tadpoles, tadpoles provide energy to fish and fish provide energy to herons. When an animal dies, other animals, fungi and bacteria turn the energy stored in that animal back to nutrients for plants.

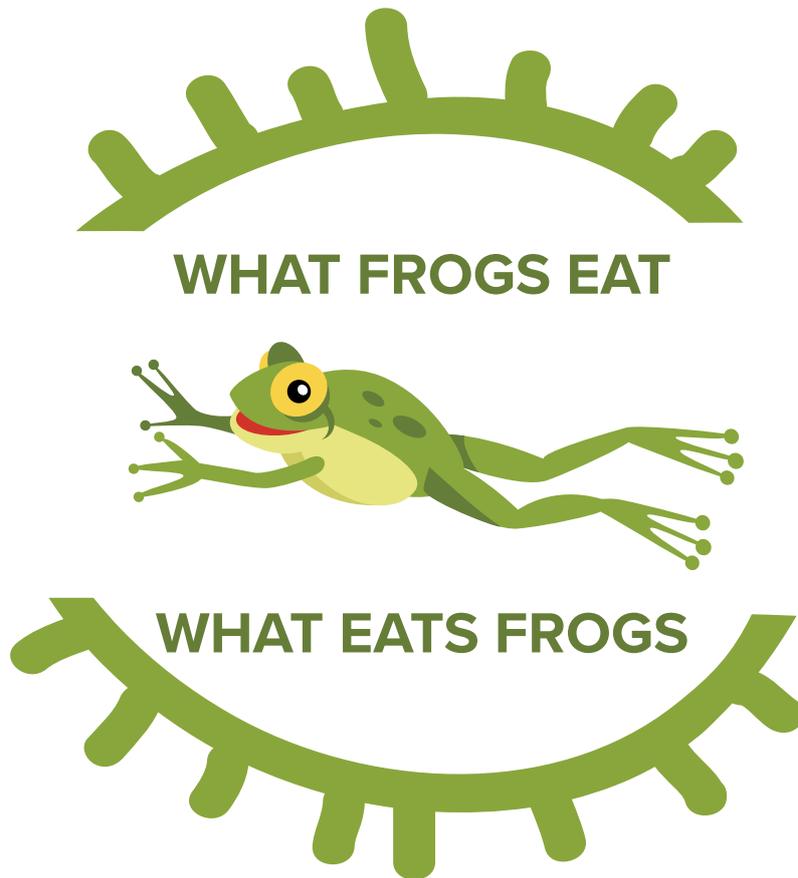
Draw an arrow starting at one of the organisms that frogs eat and point it to the frog. Then, starting at the same frog draw an arrow to an animal that eats a frog. This is a simple food chain. Students record as many food chains as they can on **Activity Sheet – Frog food chains**.

Show **Slide 20 Local frog habitat** from the interactive presentation. As a class, discuss the arrow directions and see how many food chains there are. Look at the names Producers, Consumers and Decomposers: try and label the organisms with these terms.



Frog food chains

Brainstorm all the plants and animals frogs might eat and write them around "What Frogs Eat". Brainstorm all the animals that might eat frogs and write them around the "What Eats Frogs". With your teacher's help, create 'Food Chains' that connect what frogs eat to what eats frogs.



Activity 3.3 Wetland Mural

Description

Students use art to re-create a wetland scene for their classroom.

As a class you will be creating a frog habitat mural. Using large sheets of butcher's paper (or a roll of brown paper), draw the basic cross-section of a wetland. Use ***Activity Sheet – Wetland mural*** as a guide.

Assign each student an animal that could be found in or around a local wetland. Their task is to find a picture of that animal in provided books or on the Internet and learn about its habitat requirements. They then draw or paint a version on a piece of paper, cut it out and tape or Blu-tac it to the mural where they think that animal is normally found.

Once completed, each student tells the class what they learnt about their animal's habitat. For example, a kangaroo needs grass to eat, shelter, and water to drink.

What you need

Activity Sheet –
Wetland mural

Scissors

Blu-tac

Animal identification
books

Online access

Butcher's paper

Coloured pencils

**This activity has been
adapted from:**

**Saving the southern
bell frog: An education
resource for Years 3 to 6.**
2018. State of NSW and
Office of Environment &
Heritage, NSW.

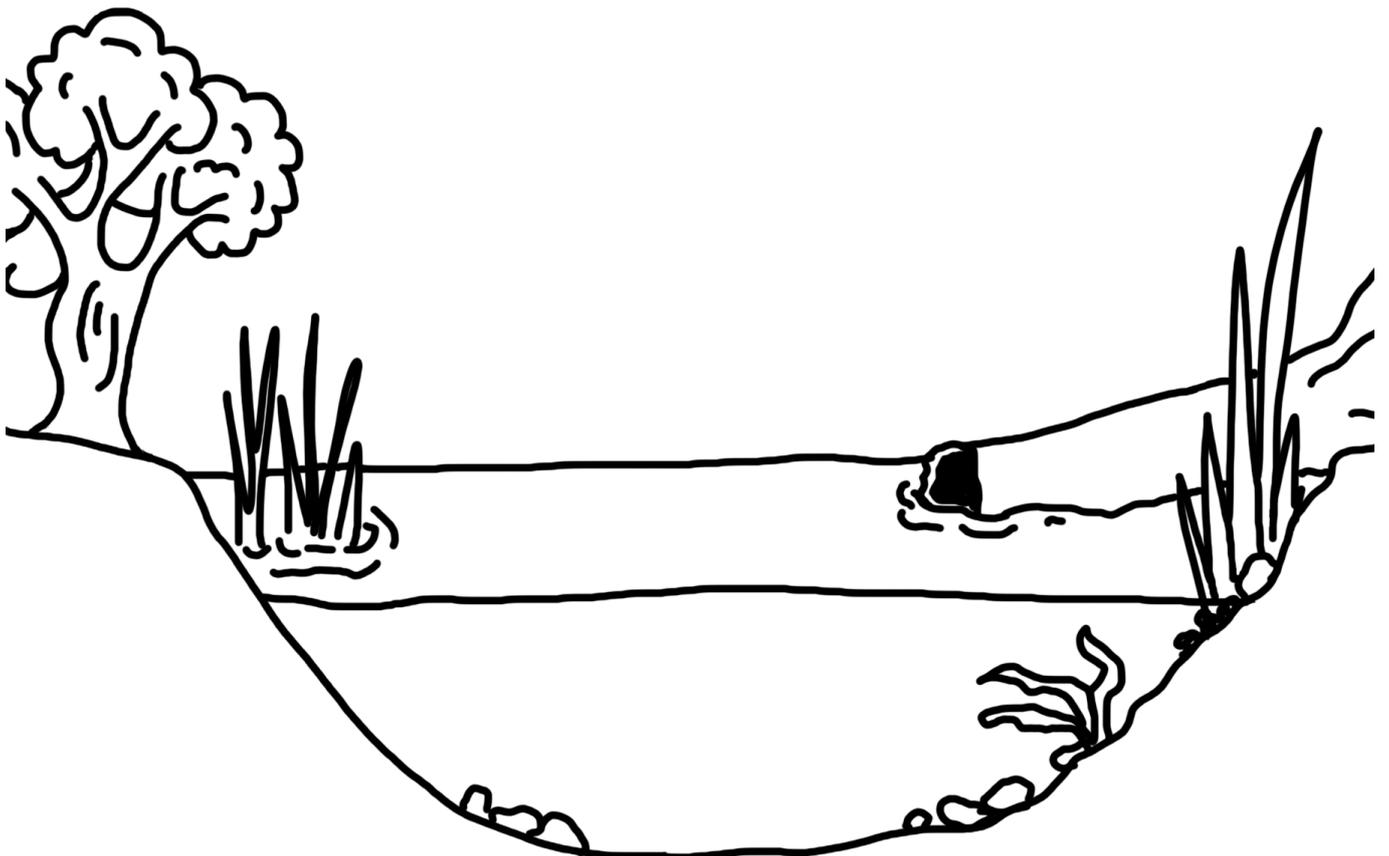
Wetland mural

Wetlands are very important. They provide homes to many animals including birds, insects, frogs, reptiles, small mammals and fish.

Using the cross-section below as an example, draw or paint a wetland on a big piece of cardboard or butcher's paper.

Below are 15 animals that can be found in or around a wetland. Find photos of these in your library books or on the Internet and draw or paint them on separate pieces of paper. Cut them out and place them in the correct spot on your mural backdrop.

- | | | |
|--------------------------|-------------|-----------------------------|
| 1. White-faced heron | 6. Spider | 11. Dragonfly |
| 2. Wedge-tailed eagle | 7. Yabby | 12. Spoonbill |
| 3. Microbat | 8. Snail | 13. Red-bellied black snake |
| 4. Small lizard (skink) | 9. Frog | 14. Golden perch |
| 5. Eastern grey kangaroo | 10. Tadpole | 15. Possum |



4. THREATS TO FROGS

Overview

The following activities aligns with **Section 4 – Threats to frogs** of the interactive presentation and the background knowledge on **pages 10-11, 18-19 and 20-22**. These activities introduce students to the threats that are facing frogs on a global and local scale. Students are encouraged to undertake a long-term whole-of-school action planning approach to protecting frogs near their school.

Activities

- 4.1 Threats to frogs** – Students investigate the threats frogs face globally and locally and how we can look after our environment to conserve frog populations.
- 4.2 Wetland action plan** – Students will undertake a long-term project that follows the cross-curriculum *sustainability action process* to conserve a local wetland. The sustainability action process provides a scaffold for investigating real issues and needs. It supports authentic problem solving through active student participation. education.nsw.gov.au/teaching-and-learning/curriculum/learning-across-the-curriculum/sustainability/sustainability-action-process

Stage

Stage 2 and 3
(Years 3–6)

Syllabus outcomes

Science

ST2-4LW-S
ST3-4LW-S

HSIE – Geography

GE2-2, GE2-3
GE3-2, GE3-3

Cross-curriculum priorities

Sustainability
Civics and citizenship

General Capabilities

Literacy
Critical and creative thinking
Personal and social capability
Ethical understanding

Background knowledge

Pages 10-11, 18-19 and 20-22

Interactive presentation

Section 4 – Threats to frogs



bit.ly/HopIntoFrogs

Activity 4.1 Threats to frogs

Description

Students investigate the threats frogs face globally and locally and how we can look after our environment to conserve frog populations.

Ask students to individually write down three threats that could be impacting frog survival. Share these ideas on the class board.

Go through **Section 4 Threats to frogs** from the interactive presentation. **Slide 25 Frogs are disappearing** lists key threats that are impacting Australian frogs. How did the class compare with this list?

Divide the class into small groups and assign each group with a threat – this could include climate change, chytrid fungus, habitat loss, pests, pollution and changed water flows. Groups need to research how these threats impact frogs and record:

- Is your threat caused or influenced by humans?
- Could your threat be avoidable?
- List actions that we can do to reduce the threat on frogs.

Introduce the terms **abundance** (number of a particular species in an area) and **distribution** (number of places a species can be found) to the students. A species becomes listed as threatened when its abundance and distribution has declined. This is why we need scientists to monitor populations, such as the Sloane's Froglet, to keep track of their distribution and abundance.

Students can help scientists out by becoming citizen scientists and recording frog calls – especially the Sloane's Froglet. Get students involved in the Australian Museum's FrogID Project. The FrogID App. is used to record and identify frog calls across Australia. If you have frogs around your school, you can take part in their school activities. FrogID has a series of resources available online to support teaching and learning about frogs. Visit: www.frogid.net.au/schools.

Extension: Pond population modeller

Students can use the ABC Pond Population Modeller to run scenarios on what would happen to the population of animals in a pond if conditions were changed. Students think about the species who will be affected and hypothesise the outcome, test their hypothesis and record what actually happens.

education.abc.net.au/home#!/media/1388707/population-modeller-pond

What you need

Internet access

FrogID App. installed on class or individual tablets

**SLIDES
25-28**

Activity 4.2 Wetland action plan

Description

Students will undertake a long-term project that follows the cross-curriculum sustainability action process to conserve a local wetland. The sustainability action process provides a scaffold for investigating real issues and needs. It supports authentic problem solving through active student participation.

Wetlands are vulnerable and they need our help to survive. We humans have altered the natural environment to the point where wetlands:

- no longer receive enough water,
- are increasingly isolated in an urbanised environment
- are under pressure from introduced plant and animal pest species
- are no longer providing good habitats for native plants and animals.

But not all is lost! We can make a difference in our local community by raising awareness of wetlands and supporting their conservation, proper management and improvements.

Students are going to work as a team to develop an action plan for a local wetland and its inhabitants. Think about weeds, water quality, revegetation, minimising chemicals, water sources and natural flows were appropriate, vegetation types, grazing, pest animals.

What you need

Activity sheet –
Wetland action plan

This activity has been adapted from:

Saving the southern bell frog: An education resource for Years 3 to 6. 2018. State of NSW and Office of Environment & Heritage, NSW.

Wetland action plan

Step 1: Make your case for conservation

Focusing on one of the following species may help you in developing your wetland action plan: Sloane’s Froglet, Brolga, Billy Buttons or Sudell’s Frog.

Build your case for conserving wetlands by focusing on one of these special wetland species, finding more information about their plight, what is currently being done to look after them and who in your community can help.

Build your case

Can we find more information about our wetland species? Where should we look? Who should we ask?

If we were to create the ideal habitat for our wetland species, what would it look like? Draw your ideal habitat in your learning journal.

Do we need to visit our wetland species' preferred habitat? What data should we collect if we visit a site? Who should come with us?

Can we change things in our local community to improve their habitat?

ACTIVITY SHEET

Step 2: Explore your options

Review your case and decide what action plan can be taken.
Use the following questions to guide the process.

Actions to take

What actions have been done to conserve our wetland species?

Who can help us?

What actions do we want to take?

What resources would we need to increase habitat?

How will we know if the changes we make have been successful in increasing our wetland species' numbers?

How much time will it take?

What might limit our actions?

Step 3: Develop your action plan

Develop a proposal to convince the school principal of your action plan. Make sure you have connected with your support partners, especially the Corowa District Landcare and the Federation Council.

Once approved, you will need to tell the rest of the school about your plan. How will you do this?

1. Goal

Why have we chosen the our wetland species?

2. Actions

What do we intend to do?
Outline the actions you will take.

3. Support

Who will be involved? Include any technical people from the community that could help, e.g. scientists, water managers.

4. Timeframe

When will we do it? How long will it take? Create a timeline for your plan.

5. Budget

Are there any costs? What are they? Your teacher can help estimate costs, if there are any.

6. Limitations

Record any issues that could limit us in implementing this action plan.

ACTIVITY SHEET

Step 4: Take action

Work together to put your plan into action. Remember to follow the sequential steps you have identified, record what you produce- or intent to produce, monitor your progress and collect data to help measure your success.

Outline each of your actions

For example:

Action		Create an awareness flyer		
Step		Outputs	Completed	Result or lesson learnt
1	create flyer			
2	print flyer			
3	distribute flyer			

ACTIVITY SHEET

Step 5: Reflect

Reflecting on your action process is an important part of any good project. Did you make the right choices? Could you have done something better? Can others learn from your successes or failures? Use the questions below to help your reflection.

Time to reflect

Did we achieve our goal of improving our wetland species' habitat in our local community?

Would our action plan help other schools protecting wetland species habitat?

How did we measure this?

How can we communicate our success and engage others to try our idea?

What could we have done differently to get a better result?

Thinking back on what was achieved, the most enjoyable part of the project was...

Knowledge sources

Some of the information in this resource has been gained from the following sources.

State of NSW and Office of Environment & Heritage (2018) *Saving our species. Saving the Southern Bell Frog. An education resource for Years 3 to 6.* Office of Environment and Heritage, Sydney.
www.environment.nsw.gov.au/research-and-publications/publications-search/saving-the-southern-bell-frog

Coleman, P. and Coleman, K. (2013) *Corroboree Frog Education Kit.* Wirraminna Environmental Education Centre, NSW.

Ginninderra Catchment Group (2009) *Frogwatch Schools Education Kit.* Ginninderra Catchment Group, ACT.

Littlejohn, M. (1958) *A new species of frog of the genus Crinia Tschudi from South-eastern Australia*, Proceedings of the Linnean society of NSW, 83 (2), 222-226.

The case for Sloane's Froglet: Generating ecological knowledge with the intent to benefit biodiversity.

Alexandra Ruth Knight (2015) Thesis.
researchoutput.csu.edu.au/ws/portalfiles/portal/9315984/80314

Frogs of south-west NSW: A glovebox guide to their identification, ecology and conservation.
www.environment.nsw.gov.au/research-and-publications/publications-search/frogs-of-south-west-nsw

Bruce Pascoe: Aboriginal story gets lost in translation.
www.sbs.com.au/nitv/article/2016/10/18/bruce-pascoe-aboriginal-story-gets-lost-translation

NRM Education (n.d.) *Engaging with Nature. Frogs. Teacher Information Pack.* Government of South Australia, Adelaide.
www.naturalresources.sa.gov.au/files/sharedassets/adelaide_and_mt_lofty_ranges/monitoring_and_evaluation/schools/amlr-me-schools-frog-teacher-pack-gen.pdf

Further information

The Australian Museum australianmuseum.net.au/learn/animals/frogs/

The Australian FrogID App run by the Australian Museum
www.frogid.net.au/

The Amphibian Research Centre frogs.org.au

Clulow, S. and Swan, M. (2018) *A complete guide to frogs of Australia.* Sydney: Australian Geographic Holdings.

Tyler, M. J. and Looby, M. (2004) *It's true! Frogs are cannibals.* Sydney: Allen and Unwin Children's.

